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## The Mechanical Preparation of Anthracite.*

BY RICHARD P. ROTHWELL, Mining Engineer.

WITH SUPPLEMENT.

THE anthracite coals of Pennsylvania are all mined from large veins. A seam less than four feet in thickness is generally considered as unworkable, those from which most of the coal now comes being from 8 to 30 feet thick. The system of mining employed is, almost without exception, that known as "chamber and pillar work;" that is, the coal is taken out of chambers of from 18 to 30 feet in width, and pillars of from 12 to 20 fest are left between these to support the roof. In general, the entire thickness of the seam, even though it be 20 to 30 feet, is taken out at one operation, and owing to the hardness of the coal, the use of powder for breaking it down is universal. The blast brings down the coal in very large blocks, which are broken up with the sledge to such a size, from 20 to 60 lb., that a man can readily lift them into the mine cars or wagons, the top rail of which is about 5 feet above the track. This, of course, applies to the case where the seam is nearly horizontal and the cars are taken up to the face of the work. Where the beds dip at an angle of 20 to 45°, the coal is carried down the chambers in shoots, and where the angle is from 60° to vertical, the chamber is kept constantly full of coal, some being drawn out at the bottom as room is required at the top to mine it. Where the inclination of the seam is very great the coal is frequently "shelly," and breaks up easily, making much more waste than where it is hard, as is generally the case in the less disturbed beds.

When circumstances will permit, the larger bands of shale are separated from the coal in the mine, and the fine coal is also sometimes left in the chambers, though not to so great an extent as was formerly the case.

The amount of coal abandoned in the mines, in pillars for the most part, will average throughout the anthracite region to-day from one-third to one-half of the entire coal of the beds worked over; it rarely gets as low as one-fourth, under very favorable circumstances, and not unfrequently exceeds one-half in high pitching seams.

Owing to its difficult ignition, it is necessary to break anthracite to a small size before it can be used for general domestic and manufacturing purposes. The blast furnace is almost the only large consumer of "lump" or unbroken coal, so that the small sizes always command a higher price than the large, and a considerable part of the lump coal is broken up to the sizes demanded by the market.

This breaking is always effected by means of pairs of iron rollers revolving together, and with projections, or "teeth," formed either of cast iron, cast or forged steel, or wrought iron with steel points. Till within six or seven years, the cast iron teeth, sometimes with chilled points, were in general use, but experience has since proved very fully that the amount of waste or fine coal made in breaking with sharp, pointed teeth, is much less than with the round ends formerly used, and we find the best breakers to-day provided with sharp steel teeth, which can be taken out and sharpened when they wear down; and, though they are quite expensive in first outlay, the saving of coal which their use effects would pay for the most expensive rolls in a very short time.

After the coal leaves the mine it is dumped on a shoot having a grating, "a" (see drawing) of iron bars, 4 to 7 inches apart, at the lower end, and a gate immediately above the bars, so that by raising the gate more or less the man in charge can regulate the amount of coal running down. All but the largest lumps pass through this grating on to a shoot, which carries it into the mud screens "b b." The lump coal that passes over the first set of bars lands on a platform, "c," where it is "picked," that is, the shale is picked out, and it then goes into the lump coal shoot, at the commencement of which there is a short set of bars, "d," or grating, which lets through all the smaller pieces.

If it be desired to make a large proportion of small sizes, a portion of the lump coal, after being picked, is pushed through a hole on the platform into the No. 1 or "crusher" rolls, "e e;" these are usually from 18 to 36 inches in diameter, and 30 to 40 inches long, and the space between the points of the teeth is equal to 3¼ to 4½ inch mesh on the revolving screens. The rolls are set closer together or further apart as the market calls for a greater or less proportion of the smaller sizes of coal.

* A paper read before the American Institute of Mining Engineers at the St. Louis, meeting, May, 1874.

The coal that has gone through these No. 1 rolls joins that which went through the bars, "a," and goes into the mud screens, "b b," or it goes direct from the No. 1 rolls into the steamboat screen, when there is one, as in the accompanying drawing. There are generally two mud screens (their dimensions are given below). They revolve with a periphery speed of from 180 to 200 feet per minute, and have an inclination of from ⅜ to 1 inch in 12. The coal is here separated from the fine coal or "dirt," which is sent direct on to the culm bank. As this screening is a preliminary one, several sizes of coal are allowed to go through together, and thence they run down shoots into the main screens, where they are separated into the usual market sizes.

The sizes of coal made at a "breaker" are:

*Lump coal*, being the largest lumps as they come from the mine.

*Steamboat coal*, the largest lumps that pass through the bars "a" and "d," and the largest of that going through the No. 1 rolls, "e e." It passes sometimes through a screen, called the "steamboat screen," as in the drawing, passing over a 4 inch square mesh, and sometimes over fixed bars.

No. 1. *Broken or Grate Coal*, goes through a 4 inch mesh and over a 2¾ to 2½ inch mesh.

No. 2. *Egg Coal*, goes through a 2¾ to 2½ inch mess, and over a 2¼ to 2 inch mesh.

No. 3. *Large Stove Coal*, goes through a 2¼ to 2 inch mesh, and over a 1⅞ to 1½ inch mesh.

No. 4. *Small Stove Coal*, goes through a 1⅞ to 1½ inch mesh, and over a 1⅛ to 1 inch mesh.

No 5. *Chestnut Coal*, goes through a 1⅛ to 1 inch mesh, and over a ⅝ to ½ inch mesh.

No. 6. *Pea Coal*, passes through a ⅝ to ½ inch mesh, and over a ⅜ to ¼ inch mesh.

No. 7. *Buckwheat Coal*, is rarely made, except when the coal is washed on the screens, and where the chestnut and pea coal made have the larger dimensions above given.

*Dirt* passes through a ⅜ to ¼ inch mesh, or a still finer one where No. 7 is made.

These dimensions vary with the nature of the coal, the condition of the market; and the smaller sizes with the state of the coal, wet or dry, as it comes from the mine, and with the nature of the preparation. In some places this coal is washed as it passes through the screens. This is particularly the case where it comes wet from the mine, and consequently has the dirt sticking to it, making it difficult to distinguish the slate from the coal. In other cases it is screened dry.

The accompanying working drawings show the arrangement of the screens and rolls, and the length of the segments or divisions of a screen for the different sizes. These dimensions vary, of course, according to the size and pitch given the screens, and the proportion of different sizes the colliery is expected to make; in other words, according to the nature of the coal and the market which it is intended to supply.

After passing through the mud screens "b b," and the steamboat screen "f f," the coal that is already sorted to market size has the slate picked out on shoots, which lead it direct into the pockets. The larger sizes, "steamboat" and "broken," are often run through the main or No. 2 rolls "g g;" these are from 20 to 48 inches diameter, and 30 to 40 inches long, and are usually set so that the distance between the points of the teeth is equal to 2¼ to 3 inch square mesh.

In these, as in the other rolls, the length of the teeth, working point against space, is for steel ⅓ths, and for cast iron ⅖ths of the mesh.

All the coal that goes through the rolls should first have the "slate" carefully "picked" out.

All the coal coming from the No. 2, or main rolls, and the smaller sizes, Nos. 3 and 4 (above chestnut and pea size), coming from the "mud" and "steamboat" screens, go direct into the main screens "h h," where they are separated into the several sizes. The chestnut, pea, and some of the culm or "dirt" from the main screens, and that from the mud and steamboat screens, go into the chestnut screens, where they are separated into sizes according to the above standard. All the sizes from No. 4 upwards are "hand-picked" on inclined tables, shoots, or "telegraphs" (as the shoot which carries the coal from the screens to the

pockets is cal'ed, before being run into the pockets. The chestnut and pea coals are not picked.

Where it becomes necessary to break up the No. 2 or egg coal to stove size, a third pair of rolls, called the No. 3 or "monkey rolls," is used. These rolls are placed below the main screens, from which they take the No. 2 coal, and they necessitate the use of one or two small screens to sort the coal that passes through them.

On the drawing annexed no provision was made for these No. 3 rolls; their dimensions are usually from 15 to 24 inches diameter, 24 to 30 inches long, and they are set so that the distance between the points of the teeth is equivalent to 1⅜ to 2 inch mesh of screen.

The accompanying working drawing, designed for preparing coal from beds making a good deal of dirt or fine coal, and where the market would take the average proportion of the different sizes, including steamboat coal, makes it unnecessary to enter into any long description of the "breaker." We will confine ourselves to some general remarks.

Our "coal breakers," as the buildings in which anthracite is broken and screened are called, are always frame structures, built of oak, pine, or hemlock timber, in the manner shown in the drawing; their height from the track under the pockets to the dump platform varies from 65 to 90 feet. This height is regulated as follows: the discharging shoot of the pockets must be from 8 to 9 feet above the railroad track, in order to allow the cars and their projecting "breaks" to pass under; the bottoms of the pockets must have a pitch of 5½ to 6 inches in 12, that the coal may run down in them. The depth of the pockets will vary somewhat with the certainty of regular supply of cars, but they are generally made to hold about 75 to 100 tons each. The lump coal shoot holds a much larger amount. All the shoots carrying coal from one part of the "breaker" to another should have sufficient pitch to let the coal run freely, and thus avoid handling. This will require a pitch of from 3 inches in 12 for clean coal running over clean sheet iron, to 7½ or 8 inches in 12 for wet fine coal on wooden or even iron shoots. It is a very great mistake to seek to economize timber in the height of the "breaker", by giving an insufficient inclination to the various shoots, for the timber, including carpenter's work, costs say $30 per 1,000 feet (Board measure) for hemlock, that costs $15 at the mill; or say $40 for pine, costing $25 at the mill; and the difference of 10 feet in the height of a "breaker" is a very small matter, while the continual trouble and limited capacity, when the shoots are not steep enough to carry the coal easily, are very heavy and constant sources of expense.

The pitch necessary and convenient for the several shoots is marked on the drawing. It should be recollected that these shoots are all either of sheet or cast iron, and become bright with use. At first the pitch indicated may not appear sufficient, but a greater inclination will be found inconvenient after the iron becomes polished.

The fundamental conditions that should govern the designing of a "coal breaker" are:

1. The dirt, or fine coal, as it comes from the mine, should be separated at the earliest possible stage and sent to the dirt pocket, instead of carrying it down to the main screens, where it is mixed with freshly broken coal.

2. All coal should have the slate carefully picked out before it is allowed to go through the rolls.

3. No coal should be put through the rolls except what actually requires breaking.

4. Abundance of room and light should be provided wherever the coal has to be picked by hand, and, as above stated, the shoots should have sufficient inclination (but not too much) to allow the coal to run without handling.

Simple and self-evident as these conditions may appear, they were very generally disregarded in the construction of our older "breakers", and we constantly find *all the coal*, small and large, coming from the mine, except the lump coal, passed through the rolls, and that before any picking has been done. The results are that much more dirt or waste is made than is necessary by the breaking up of coal already small enough; and as each piece of slate going into the rolls is broken into several pieces, it requires a correspondingly greater number of hands to pick it out than would have been necessary had the picking been done before breaking. Cast-iron rolls with sharp steel teeth are the most economical; they probably make fully 10 per cent. less waste than do cast-iron pointed rolls. There is a diversity of opinion on the question of the best size of roll; some preferring small, others large. We are well satisfied that the larger the roll the less waste will it make, and with large rolls the teeth should be set point to point, and not point to space, as is usually done. This will, however, depend somewhat on the condition of the coal as it comes from the mine. Sometimes, when the bed is "faulty", the coal breaks up into long flat pieces, which are objectionable in marketing the product, and the coal may be broken more thoroughly, though probably with more waste, by running the rolls "point to space." The speed of the rolls is generally from 700 to 900 feet per minute at the periphery. When the engine power is sufficient, and the desired quantity of coal can be broken at the lower speed, it is probably less wasteful than the higher. The gears on the roll shafts driving the rolls are made with extra long teeth, so that the distance between the rolls may be varied as the requirements of the market may demand.

There is a great variety in the make of breaker rolls; some manufacturers make a simple hollow cast-iron cylinder, with pyramidal teeth cast on it; others make the roll in three or more segments, which are bolted together, forming the cylinder. Others, again, use a series of cast-iron rings, with only *three* large teeth on each; these are put on the shaft over a feather, and the last one keyed up, and the two rolls running at different speeds. Another form has one roll with teeth, and the other with only a few slight projections, the idea being to assimilate the operation to breaking coal with a pick on an iron floor. Sometimes the teeth are straight pyramids, at other times they are made "hawk-bill," or with the front edge radial and the back curved so as to give the necessary strength, the object in this case being to have the point, and not the face or edge, of the tooth strike the coal; with large rolls this object is best attained, and this form of tooth is the best. With steel teeth rolls some makers take cast-steel teeth, sharpened and tempered, and cast the cylinder of the roll on them, continuing to run the metal through the mold till a perfect weld is made between the steel and the cast-iron—the teeth being heated before being put in the mold. Other manufacturers take a forged tooth, turn off the lower end of it, and drive it into a bored hole in the cast-iron cylinder. This method, though very expensive, has the advantage that when a tooth gets broken, it can be taken out, or driven through, and another put in.

The rolls are enclosed in a cast-iron box open at the bottom, and with an opening over the center of the rolls to let the coal in.

*Screens.*—The screens are always made with cast iron segments. These are light castings, weighing only about 7½ to 8 lb. per square foot. The weight per square foot varies but little for the different sizes of mesh which we have already given. The screen shaft was formerly made of wood, then of cast iron; now rolled "phœnix" columns are much used, which have the advantage of less weight. The wooden shaft always had so much spring in it when it was of any considerable length that it would break the cast-iron screen segments. Formerly woven wire screens were in general use, now they are replaced everywhere by cast-iron segments except for the chestnut screen, and the very fine mesh screens, used to separate the dirt from the coal, the very fine castings not being strong enough to withstand the blows given them to shake the dirt and coal out of the meshes where it often sticks.

The length of screens varies with the kind of coal to be made, and the quantity of "dirt" that comes from the mine, from 12 to 30 feet. The diameter varies from 4 to 7 feet, the main screens being usually 5 to 6 feet, the mud screens 6 to 7, and the chestnut screens 4 to 5 feet. The periphery speed of screens is from 180 to 200 feet, and the pitch given them varies from ⅞ to 1¼ inches in 12 in. They should be driven from a different shaft from the rolls, which have a variable speed according to the amount of coal passing through them. The screens should run very uniformly. Where the coal is washed in screening it is done by means of water falling from a perforated trough on to the screen while it revolves.

The capacity of a breaker is never limited by the rolls. They can always break more than the screens can clean. The limit is either in the screen capacity or in the picking room.

*Mechanical separation of coal and slate.*—Within the past three or four years efforts have been made, with partial success, to introduce a modification of the old Freiberg jigging machine for the separation, in water, of the slate from coal. Several mechanical separators have been tried, and though they have not as yet received any extended application, yet there can be little doubt that the work can be done in this way much more efficiently than by hand labor. The proportion in specific gravity between anthracite and slate is as about 1·4 or 1.5 to 2.2. Where the coal and slate are in separate pieces and the coal is of nearly uniform size there can be no serious difficulty in separating them mechanically, but where the coal is intimately associated with the shale or "boney," as it is usually termed, there is not much difference in specific gravity between the boney coal and the carbonaceous shale, yet even then the mechanical separation should do the work better than the boys usually employed, at least for all the smaller sizes, say, Nos. 3, 4, 5, 6 and 7. The large sizes, broken and egg (No. 1 and 2), can best be picked by hand. No effort has ever been made to separate the shale from the coal in the sizes below No. 4, though it is very evident that they are specially adapted for mechanical separation, and as their use is rapidly increasing for domestic and manufacturing purposes, such a separation would enable the producer to put them in market at a price very little below that of stove coal, while now they are quoted $1 per ton below it. The use of the "base burning" stoves has greatly extended the consumption of chestnut and pea coal, and if they were washed free from slate they would be preferred by many consumers at a very small difference of price in their favor.

Many of our manufacturies to-day use nothing but pea coal under their steam boilers, and as any measure which extends the consumption of these sizes diminishes the waste at the mines, and consequently tends to reduce the price of all the other sizes, the importance of the subject must be evident.

*The waste made* in this system of mechanical preparation of anthracite has not been determined by careful experiment; it varies from one colliery to another, according to the nature of the coal and of the machinery, and particularly of the rolls employed in preparing it. Taking the coal as it comes from the mine, where the seam is flat and but little "dirt" is sent out, there will usually be a loss of from 20 to 40 per cent. In the breaking up of clean lump coal to the smaller sizes there will be a loss of from 15 per cent. under the most favorable circumstances, to 30 per cent. under less advantageous, though much more usual conditions; this is where no smaller mesh than ⅜ inch is used on the screens.

*The cost of preparing anthracite* in the manner described varies according to the greater or less proportion of the smaller sizes made. As the miners were

paid by the car, of which the estimated yield was based on the market coal obtained and not on the direct weight of the coal coming from the mine, the loss of mining this waste fell, and now falls, on the miner. The royalties to the landlord are paid on the coal actually sent to market, so he loses his royalty on the waste, while the operator loses on the handling of an unprofitable product and on the greater wear and tear of machinery, etc. ; they had not, therefore, sufficient inducement to study economy till they (the operators) commenced to purchase the coal lands, and the miners, in some places, insisted on being paid by actual weight taken from the mine.

We may now reasonably expect this subject to attract more attention than it has hitherto received.

The cost of preparation may be given in a general way as varying from 35 to 45 cents per ton ; of this, about 10 cents per ton is for depreciation of machinery and breaker buildings, and the greater part of the balance is paid to the "breaker boys."

The cost of a breaker having a capacity of, say, 600 tons per day, such as is shown in the accompanying drawings, when built of hemlock lumber, would be about $45,000 to $55,000, including all machinery. A more elaborate construction, with the requisite machinery for the preparation of 1,500 tons per day (including about 25 per cent. of lump coal) would cost $75,000 to $85,000, or, if built of oak or Georgia pine, it might cost $90,000.

The whole cost of the waste in preparing anthracite should be more fully investigated by the large companies that now control that trade and own, practically, the whole field. A series of carefully conducted experiments would undoubtedly lead to a very important saving by determining the best machinery for breaking and cleaning coal, and the most economical manner of carrying on the work. It must be admitted that the anthracite coal must be broken to small sizes before it can be used without an artificial draft, and the system of breaking at the mines with specially adapted machinery is undoubtedly the best ; but it must also be evident that an immense improvement in the direction of economy may be made by a thorough investigation of the subject, inducing the adoption of improved machinery.

## Extracts from a Report on Panamint Mining District.

By C. A. STETEFELDT, M. E.

CONCLUDED FROM PAGE 242.

### BREAKS.

From the preceding statements it will be seen that the main system of veins runs nearly parallel with the course of Surprise Cañon. Hence the gulches which intersect the slopes of the mountain sides, must also cut the veins. In examining these points of intersection, we find that the veins are more or less disturbed and broken. It is apparent, also, that these gulches owe their existence to eruptive forces. On the south slope of the cañon we find also fissures with crushed limestone, for instance, near the Esperanza, causing a break in this vein.

### INFLUENCE OF THE SLATE UPON THE CONTINUANCE OF THE VEINS.

It has been remarked before, that the veins are not confined to the limestone, but also continue through the slate. When they enter the slate, however, we find them generally split up into several branches, which condition is best illustrated at the east end of Stewart's Wonder.

### BRANCH VEINS.

Another peculiarity of the district is the occurrence of branch veins, which dip very flat, are sometimes much more developed, and carry richer ore, than the main vein. This case is well illustrated in Jacob's Wonder.

### CROPPINGS.

I hardly know a mining district where more continuous and bolder croppings are found than in Panamint. In mounting the ridges on either side of Surprise Cañon, the whole system of veins lies spread before the observer like a huge map. These croppings of compact quartz vary in width from a few inches to 20 feet and even more, and, being less destructible than the country rock, often project like cliffs over ten feet above the ground. They carry rich ore in continuance over long distances, but are also barren for long distances.

### CHARACTER OF THE GANGUE.

The gangue of the veins is a hard compact quartz laminated in thick layers parallel to the walls. The only exception to this rule was found in the Sunrise, situated at the extreme east end of the mineral belt. Here a great part of the quartz is spongy, the cavities often filled with crystals of quartz. In this mine also calcspar is found in the gangue, which I have not observed anywhere else.

### CHARACTER OF THE ORE.

The predominant silver bearing mineral, which gives the ore its value, is a rich silver fahlore. It appears entirely undecomposed very close to the surface. In many places, however, we find it changed to stetefeldtite, that is, a combination of antimoniates of copper, lead, iron and zinc, with sulphuret of silver and water. Where this mineral makes its appearance, it is accompanied by the blue and green carbonates of copper. Much less frequent we find silverglance, chloride of silver and native silver. These latter minerals are predominant only in one mine, the Sunrise. Of the base minerals we find blende and galena.

### DISTRIBUTION OF ORE IN THE GANGUE.

As a general rule, the silver-bearing minerals are not finely disseminated through the quartz, but form visible grains from the size of a pinhead to a large pea, and occasionally much larger. The ore occurs also in pay streaks, parallel to the walls of the vein. Both these characteristics make it very easy to assort the pay ore from the low grade ore and barren quartz. The ore in the Sunrise is the most prominent exception to this rule, as the spongy quartz contains the silver-bearing minerals finely impregnated.

### RICHNESS OF ORE.

The ores of Panamint are of very high grade, as the following assays show :

| | Per ton. |
|---|---|
| Pure fahlore from Stewart's Wonder | $919 57 |
| First class ore from " " | 215 19 |
| Average of pay streak from incline of Stewart's Wonder | 83 24 |
| Selected first-class ore from Jacob's Wonder | 348 11 |
| Low grade ore from " " | 12 56 |
| Rich ore from croppings of Wyoming | 609 47 |
| Average of pay streak from Little Chief | 84 82 |
| Ore with blende and galena from do. do | 59 69 |
| Ore from pay streak from Hemlock | 197 91 |
| Ore from pay streak from Harrison | 152 33 |
| Average of pay streak from upper cut of Hudson River | 80 10 |

It may be safe to estimate the value of ore from the pay streaks of these mines to be from $75 to $100 per ton. But much higher grades could be selected should this be desirable.

### DISTRIBUTION OF THE PRECIOUS METAL WITHIN THE MINERAL BELT.

In reviewing these assays, and estimating the percentage of fahlore contained in the different samples, I come to the conclusion that the mineral belt carries much richer fahlore to the South than to the North. Indeed, the ore found in Narboe Cañon, North of Surprise Cañon, becomes more base, showing more lead minerals, and a fahlore richer in copper but poorer in silver.

### INFLUENCE OF THE SLATE UPON THE DISTRIBUTION OF ORE.

In connection with the above stated facts, I have also to remark, that the slate seems to have considerable influence upon the distribution of the ore in the veins. All the extensive ore chimneys are found in the limestone, and wherever a vein runs deep into the slate, the croppings soon become barren. There are some veins cropping in the slate alone, which show no trace of ore.

### EXTENT AND DIP OF ORE CHIMNEYS.

The croppings of the veins show ore chimneys of great extent, measuring on the prominent veins from 300 to 600 feet in length. From observations made in the gulches which intersect the veins, I am led to believe that the dip of these ore chimneys will be East of North. Another reason which confirms this opinion is, that the limestone dips in that direction.

### DEVELOPMENTS IN DEPTH.

It is to be regretted that so little has been done in regard to the development of the mines in depth. And it is to be regretted still more, that the most important developments show nothing favorable, and this has evidently deterred the prospectors from continuing their explorations. It is my opinion that these explorations have in some cases been started at the wrong place, in others on inferior mines, and in others with lack of judgment.

### PROBABILITIES OF THE CONTINUANCE OF THE VEINS AND THE ORE IN DEPTH.

In considering the magnificent geological formation of Surprise Cañon, the regularity of the grand system of parallel veins, the uniform character of the silver-bearing mineral in this system, the extensive ore chimneys exposed on the surface, the presence of an eruptive rock—which is highly favorable to the formation of mineral deposits—in close proximity to the mineral belt, I feel confident that these veins will continue in depth, and also that the ore will continue in depth, and very likely of similar richness to that found at the surface. This judgment may appear somewhat bold, but I cannot arrive at any other conclusion after a full consideration of all the facts which observation, experience, and science bring before me.

### DESCRIPTION OF THE MINES.

I now proceed to describe two of the principal and most characteristic veins of the district.

### THE WONDER.

This remarkable vein has been located on the north slope of Surprise Cañon for a distance of 5250 feet, and its croppings, intersecting Woodpecker, Jacob's Wonder, and Stewart's Wonder gulches, can be traced nearly 5000 feet. The most valuable of the claims are Jacob's Wonder and Stewart's Wonder, which are separated by the Challenge claim of 750 feet.

### A. JACOBS WONDER, (1500 feet).

The croppings of this claim striking nearly West-East, with a dip to the North of 80°, run over the ridge between Woodpecker and Jacob's Gulch, intersect the latter, and extend to the summit of the ridge between Jacob's and Stewart's Gulch. In Jacob's Gulch (425 feet above Rain's camp) we observe a slight break in the vein. To the West, the croppings extend up the steep mountain to its summit, a height of 500 feet above the gulch, the main vein being joined near the summit by a south branch vein of, I judge, 15 to 20 feet in width. These croppings vary considerably in width, and are mostly barren. The ore chimney lies East of the gulch. Here we find the croppings of the main vein to continue East in a width of from 4 to 6 feet, falling, however, in places considerably below these dimensions. South of the main vein is a branch vein from 10 to 12 feet wide, which dips 35° North. In the gulch both croppings come together, and form an enormous mass of quartz, 20 to 25 feet wide. This branch does not continue West of the gulch, but can be traced East nearly to the Challenge claim. On account of the topography of the hill, the croppings of the branch vein diverge to the East from the croppings of the main vein. At the same time they diminish in width to about 3 feet. Both croppings show good ore for about 500 feet.

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THE *Bulletin of the American Iron and Steel Association* still continues its endeavors to make the Institute of Mining Engineers responsible for our editorial opinions, and even for our market reports. Perhaps we should not be surprised at the difficulty it finds in comprehending how an independent Institute can have for its organ an independent journal; but, after our personal and editorial correction of the error it had made in heading its criticism of our views on the Iron Trade question "The American Institute of Mining Engineers," it is somewhat more than bad taste to continue the offense. The *Bulletin* devotes a large part of its space to demonstrating that this Journal *is* the official organ of the Institute of Mining Engineers—a fact which no one ever denied, and which we affirm at the head of our columns every week; but that no more makes the Institute responsible for our opinions than for the statements of our advertisers. Possibly, in time, the *Bulletin* may come to understand how an editor may write what he thinks, and not merely what he is paid for writing, and that an Institute whose object is "to promote the more economical production of the useful minerals and metals," may have for its medium of communication with its members a Journal which is devoted to the same objects, and has independence enough to express an honest opinion of the best means of attaining that end.

CHARLES R. HARDICK, whose death, on the 15th inst., lost to the craft of Mechanical Engineers one of its most gifted and progressive members, was a self-made man, with a rare amount of sound practical common sense in designing machinery. He quickly distinguished between the ingenious and the useful, and brought his inventions at once into the field of practical machines. His Niagara Direct-Acting Steam Pump is a model of simplicity and efficiency, and has brought well-deserved reputation to its inventor. From the position of a mechanic on daily wages, Mr. HARDICK rose to the position of one of our large manufacturers, and acquired a financial success on the solid foundations of energy, good work, and honorable dealing. He was greatly admired by his employés, for the accumulation of wealth left him still mindful of others, and they followed him to his last resting-place with a touching memorial of his genius and their esteem, in the form of a full-sized model of a Niagara Pump composed of the rarest flowers.

The readers of THE ENGINEERING AND MINING JOURNAL have contributed not a little to Mr. HARDICK'S success, for he has been a constant advertiser in these pages since the paper was founded, nine years ago, and frequently testified to this fact as one of the causes of his success. They will be pleased to learn that their old acquaintance provided that his business should go on under the direction of his manager, and without change.

## Progress in the Iron Trade.

THE *Railroad and Mining Register* has in its last number an interesting editorial on this subject, in which it cites the following statistics to show what has been done in improving the manufacture of Bessemer steel :

"Previous to 1867 some small amount of experimental steel was produced in this country, the works then building not being completed. The Troy experimental plan with one vessel produced most of it. In 1867 the Pennsylvania Steel Company began the regular manufacture of steel ingots, being the first to do so on a manufacturing scale. Cambria rolled the early product made at Harrisburg, and in 1868 the latter company rolled its own product. When the Harrisburg works started three blows per turn of twelve hours was a full day's work ; in 1868 they produced eight blows per half day, at that time the best practice in the world. In 1869 the best cupola to be had melted only 14 tons of iron per day—could not be coaxed to melt more ; in 1868 one had been designed at Harrisburg that melted regularly 40 tons per day. This form of cupola is now used in all American steel works. In 1872 it was improved, simultaneously at Harrisburg and Johnstown, by the addition of a slag tapping hole, so that it now melts 105 tons per half day easily, and can, if desired, run 18 to 24 at that rate.

"This vast improvement in smelting capacity stimulated improvement of the converting vessels, and in 1869, at Troy, the best form of converter bottom was introduced ; this has also been adopted at nearly all the works in this country. In 1870 it was introduced at Harrisburg, and by its use in connection with the improved cupolas, a product of 32 blows (1,363,406 pounds of steel) was made in 22 hours, at that time something unheard of ; the product of the European works being 12 blows in 24 hours. At the end of 1872 the Harrisburg works produced 150 blows in a week, and the Johnstown early in 1873 made 154 blows in a week. In 1873 the Harrisburg works made in a week 180 blows, yielding 890 tons of ingots. Mr. A. L. HOLLY states that in January, 1874, the Cambria works made 189 blows with 956 tons of ingots, while in February the Troy works made 50 blows and 267 tons of ingots in 24 hours, and in April 195 blows and 972 tons of ingots in a week. We note that in last month the Cambria works turned out 205 blows and 1,027 tons of ingots.

"These vastly increased products are the result of skill developed at home, and of general designs of works and of individual parts of machinery used only in this country. In connection with this vast increase of product from a given plant, a similar improvement of hammer product has taken place, as much as 80 tons of blooms being made in 24 hours by one single acting 12 ton hammer. In blooming mills every economical form has been produced which equals anything in England, and the general production of rails per turn in rail mills has been brought up at least 15 per cent. in consequence of improvements in the Bessemer products."

We have several times cited this same branch of the iron trade as an example of what may be gained by the application of skill in the design and management of our works. We have stated our belief that the more general appreciation of such facts would lead to a great reduction in the cost of making iron at many works, and that this greater skill combined with economy in our iron business is of greater importance to us to-day than any increase in tariff could be. We are not discussing the question of Tariff *vs.* Free Trade. We see no reason why the advocacy of greater skill and economy in the management of our works, many of which suffer from a deplorable lack of both, should be construed into an advocacy of free trade. They have no further connection than that the application of skill and economy will, in time, enable us to make iron so cheap that we can compete in the outside markets of the world with England, France, Belgium and Germany, and then, of course, we will be independent of Tariff. We possess iron ores in unequalled quantity and quality, and at many of our works they do not cost more than $1 50@$2 per ton, or less than one-third what ore of the same quality costs some of the large English works, where 50 per cent. ores cost $6@$7 per ton. We possess coal quite as good and very much more easily and cheaply mined than that used by most of the English works. With coal that can be put in the cars at $1 25@$1 50 per ton, or coke, as at Pittsburgh, at $2 75 per ton, we have the advantage over the English works, where even now, after recent heavy reductions in labor, coal costs $3@$4, or 12/@16/ per ton ; and undoubtedly the cost of these items can be further reduced with us by the more general introduction of machinery in mining and preparing.

Our Bessemer mills, which are all necessarily of recent origin, were, fortunately, planned by skillful and far-seeing experts, and they only throw into greater relief the gross ignorance which is still evident in some of our iron works. Competition, and not protection is what stimulates improvement in a trade, and it has induced a wonderful progress in our American blast furnace practice ; but there are still, as the *Register* well knows, a large number of works which can never expect to make iron at the prices which afford a fair profit to those more judiciously located and managed, and it is largely in their interest that the trade is periodically convulsed with a demand for more protection.

## An American Iron and Steel Institute.

A CORRESPONDENT in the *Iron Age*, of the 15th inst., wants to see an American Iron and Steel Institute organized, and apparently is not aware of the fact that we have had for several years a very worthy compeer of the famous Iron and Steel Institute of Great Britain.

Though writing over the signature of "Progress," the *Iron Age* correspondent is a little behind the times, or he would scarcely be ignorant of the American Institute of Mining Engineers, and the exceedingly valuable papers that have been read before it, for he says : "The Association (?) of Mining Engineers includes this field (iron metallurgy) in its discussions, but is not composed of practical iron men, whose capital is in the business, and it approaches the subjects treated from a theoretical rather than a practical standpoint."

"Progress" mentions as among our most distinguished iron-masters, men "whose prominence in blast furnace practice has made their names public property," and especially suited to form such an association, the venerable DAVID THOMAS, the first President, and now one of the four honorary members of the American Institute of Mining Engineers ; WILLIAM FIRMSTONE, of the Glendon Iron Works, an active member, and whose son, FRANK FIRMSTONE, is a Manager of the same Institute ; Mr. EDMUND PECHIN, of Dunbar furnace, a Vice-President of the Institute of Mining Engineers, and one of its most active members ; JAMES C. PLATT, of Franklin Works, New Jersey, also an active member, whose communications to the Institute have been widely read ; JOHN FRITZ, of Bethlehem, also a member of the Institute ; A. L. HOLLEY, a Vice-President of the Institute,

and one of its most active members, whose admirable papers on Bessemer steel plant and American steel rail mills, were communicated to the Institute last May, and whose valuable communications at previous meetings have been copied the world over. BRITTAIN, of Philadelaphia, the well-known chemist, Prof. COX, of Indiana, and LESLEY, of Philadelphia, are also active members of the Institute of Mining Engineers, LESLEY b Vice-President. To close the list "Progress" names ABRAM S. HEWITT, Vice-President, and an active member of the Institute of Mining Engineers, as specially suited to "support the dignity of the iron industry in comparison with the present able Chairman of the British Institute," and "Progress" should have added, "one of the four honorary members of the American Institute of Mining Engineers."

Let "Progress" read the papers presented to the American Institute of Mining Engineers, and look over the list of its members, where he will find, in addition to the above, such names as THOMAS J. BLAIR, of Pittsburgh; KENT, of Phillipsburg; WITHERBEE, of Port Henry; GRISWOLD, of Troy, N. Y.; SAMUEL and JOHN THOMAS, of Hokendauqua; WALTER CRAFTS, of Shelby, Ala., and a host of others, the best known and most progressive of our American iron-masters, and who are directly engaged in the practice of iron making.

And among the foreign members of the Institute he will find such names as I. LOWTHIAN BELL, Prof. L. GRÜNER, Prof. TUNNER, and a number of the most distinguished English and Continental iron-masters.

And, possibly, he may then modify his statement that "the American Institute of Mining Engineers is not composed of practical men whose capital is in the business, etc." And he may admit that the American iron trade has, in the Institute of Mining Engineers, an association that compares very favorably, both in its members and the value of their communications, with the British Iron and Steel Institute, or the *Société des Forges et Fonderies* of France.

## NEW PUBLICATIONS.

"*Ladies Engineering.*" We find on our table a copy of *Harper's Bazar*, and, though at first sight it would scarcely be considered as very intimately connected with our profession, yet it certainly comes under the head of technical literature; and on a careful inspection it will be found to comply very fully with the Websterian definition of engineering: "The science and the art of utilizing the forces and materials of nature."

With all the desire in the world, we cannot do justice to the marvellous ingenuity displayed in designing frills and flounces, and French tournures, and things, with "pretty bouffant effect," and other mysterious things which "no fellow can be supposed to understand." But we rise from our study with the most profound respect and admiration for "Ladies Engineering;" and if we were a lady, which thank — — — —, we would make the *Bazar* our text-book.

## CORRESPONDENCE.

QUINNIMONT, Oct. 14, 1874.

TO THE EDITOR: SIR—In my Quinnimont letter, published in your issue of October 10, I regret to have made several important misstatements.

One dollar per ton to deliver coal in the Chesapeake and Ohio Railroad cars, is considerably in excess of the fact. The Company have repeated offers for contract work at over one-fourth less, which have not been accepted.

The cost of the coke ovens, as there given, also exceeds the true figures. Several other statements of a more general character in the same letter were made on equally imperfect information, and do the works injustice. S. F. MORRIS.

### Large and Small Water Wheels.

TO THE EDITOR: SIR—If I rightly understand the reasoning of your correspondent, "J. R., (ENGINEERING AND MINING JOURNAL, page 229, current volume) he asserts that, all other things being equal, a large over-shot wheel will give more power, theoretically, than a small one, and he desires to know whether the same will not be true of a "hurdy-gurdy" wheel, which, I suppose, is a horizontal impact wheel. It appears to me that your correspondent starts out with a wrong assumption. Given a certain amount of water flowing per second under a definite head, let w = weight discharged per second, h = height of fall:

then the total horse-power which this amount of water can perform is $\frac{w \times h}{550}$

To assume, with your correspondent, that by doubling the diameter of the wheel on which this water acts, the power exerted will be doubled, is the same as saying that a weight of 10 lb., acting at the end of a lever 1 foot long, will produce only half as much power as if it were used at the end of a lever 2 feet in length. It is true that, on account of practical considerations, there is a certain diameter for an over-shot wheel, with a fixed fall, that is better than any other, since there is a velocity of wheel, under given circumstances, that will produce the greatest efficiency. Those who are interested will find these points ably treated in Prof. RANKINE'S *Treatise on the Steam Engine and other Prime Movers*, and in WEISBACH'S *Mechanics and Engineering*.

In the case of the horizontal impact wheel, also, there is a velocity of maximum efficiency, it being about one-half the velocity of the water; so that the greatest possible theoretical efficiency of such a wheel is 50 per cent. of the mechanical effect of the water, or $0.5 \times w \times h$. In practice, however, the efficiency of an ordinary horizontal reaction wheel seldom exceeds $0.33 \times W \times h$. Under low heads it is common to make such wheels with a diameter equal to twice the height of fall of the water. This, of course, could not conveniently be done in the case of very high falls, and under such circumstances the wheel must be proportioned so as to have half the velocity of the striking water, when making the required number of revolutions for the work it has to do. The formulas given in text books on this subject are generally deduced from experiments made with low heads, not exceeding 20 feet, and being generally much less than this. For such cases wheels with diameters from 12 to 20 feet are found to be the most efficient. For the high falls spoken of by your correspondent, it is probable that the best dimensions of wheels could only be determined by experiment. It is quite likely that many of your readers have had experience with such wheels. If so, they would be rendering valuable aid to their brother engineers by sending you the results for publication.

It would appear from the foregoing remarks, that on theoretical considerations alone, there is no reason why a wheel with small diameter should have a different efficiency from a larger one. It seems probable, moreover, that within reasonable limits the diameter of a wheel can be fixed with a regard only to these two conditions:

1. That the velocity of the wheel shall be half that of the impinging water.
2. That this velocity shall be suitable for the work that is to be performed.

R. H. B.

### Gold Yield of Nova Scotia.

GOLD is, after coal, the most valuable mineral at present worked in Nova Scotia. The following table is so complete as to require little explanation. These figures are official reports furnished the government under oath, so that they are safe guides in estimating the value of the Nova Scotia mines, they show, as Mr. HEATHERINGTON says: "That gold mining in Nova Scotia is no chimera."

GOLD YIELD OF NOVA SCOTIA—1862-73.

DISTRICTS COLLECTIVELY.

| District. | Yield of Gold. Total. | Sources. From Quartz. | Sources. Native. | Average. Per 2240 lb. of Quartz. | Average. Annually per Miner. Value at £4 per oz. |
|---|---|---|---|---|---|
| | Oz. dwt. gr. | Oz. dwt. gr. | Oz. dwt. gr. | Oz. dwt. gr. | £ s. d. |
| Sherbrooke | 63,010 7 18 | 62,972 7 18 | 38 0 0 | 0 17 21 | 177 5 0 |
| Waverley | 45,532 0 16 | 45,532 0 16 | ... | 0 12 22 | 105 16 2 |
| Renfrew | 26,809 4 16 | 26,809 4 16 | ..... | 0 16 14 | 127 9 10 |
| Wine Harbor | 22,491 6 11 | 22,491 6 11 | ..... | 0 15 23 | 141 19 10 |
| Montagu | 14,863 18 6 | 14,863 18 6 | ..... | 2 15 17 | 124 13 2 |
| Oldham | 14,104 15 13 | 14,104 15 13 | ..... | 1 0 5 | 93 11 0 |
| Tangier | 11,175 18 17 | 10,967 11 17 | 208 7 0 | 0 16 19 | 61 16 10 |
| Stormont | 10,260 13 21 | 10,242 13 21 | 18 0 0 | 1 1 4 | 90 14 0 |
| Uniacke | 8,108 7 12 | 8,108 7 12 | ..... | 0 14 18 | 127 13 8 |
| Unclassified | 3,019 13 20 | 1,798 4 23 | 1,221 8 21 | 0 6 12 | 47 8 4 |
| Caribou | 2,346 19 12 | 2,346 19 12 | ..... | 0 16 9 | 127 2 10 |
| Total | 221,723 6 18 | 220,237 10 21 | 1,485 15 21 | 0 16 18 | 119 4 4 |

| District. | Miners. Aggregate Number. | Miners. Daily av. for Year of 312 working days. | Quartz. Raised. Total Colonial Weight. | Quartz. Raised. Per Man Daily. | Quartz. Crushed. Total Colonial Weight. | Quartz. Crushed. Daily. | Mills. Steam. | Mills. Water. | Mills. Total. | Stamp Heads. | Mines. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | At the end of the Year. | | | | |
| | No. | No. | Tons. cwt. | lb. | Tons. cwt. | Tons. | No. | No. | No. | No. | No. |
| Sherbrooke | 438,698 | 117 | 79,125 8 | 360'7 | 78,853 5 | 21'1 | 9 | 3 | 12 | 155 | 7 |
| Waverley | 537,004 | 143 | 78,156 10 | 272'4 | 78,966 0 | 21'6 | 2 | 1 | 3 | 60 | 3 |
| Renfrew | 262,418 | 70 | 35,289 18 | 268'9 | 36,197 7 | 9'7 | 2 | 3 | 5 | 47 | .. |
| Wine Harbor | 197,678 | 53 | 32,690 7 | 330'7 | 31,571 2 | 8'4 | 4 | 1 | 5 | 62 | 3 |
| Montagu | 148,590 | 45 | 6,201 12 | 83'4 | 5,977 2 | 1'8 | 3 | .. | 3 | 26 | 2 |
| Oldham | 188,162 | 50 | 16,038 5 | 170'4 | 15,641 0 | 4'2 | 1 | 2 | 3 | 26 | 6 |
| Tangier | 225,524 | 60 | 14,782 4 | 131'1 | 14,621 15 | 4'0 | 3 | 1 | 4 | 32 | 5 |
| Stormont | 141,180 | 38 | 12,177 15 | 172'5 | 10,834 3 | 2'9 | 1 | 2 | 3 | 28 | .. |
| Uniacke | 79,248 | 35 | 13,145 10 | 331'7 | 12,299 3 | 5'4 | 3 | 1 | 4 | 31 | .. |
| Unclassified | 79,482 | 21 | 7,080 17 | 178'2 | 5,824 19 | 1'5 | 5 | 4 | 9 | 42 | 1 |
| Caribou | 23,036 | 15 | 3,046 0 | 261'1 | 3,206 10 | 2'5 | 1 | 1 | 2 | 18 | .. |
| Total | 2,321,020 | 620 | 297,734 6 | 265'5 | 293,992 6 | 78'5 | 34 | 19 | 53 | 527 | 27 |

The above yield does not include the gold obtained in 1860 and 1861, nor what has been stolen and surreptitiously mined, which, being uncertain quantities, are of no value for the purposes of average. The amount of 6,000 oz.—of which 4,000 oz. from quartz crushed and 2,000 from alluvial and beach washings—has been officially accepted as the production previous to 1862, and apportioned, in ounces, as follows: From *Quartz*—Sherbrooke, 1100; Waverley, 1050; Renfrew, 200; Wine Harbor, 750; Oldham, 100; Tangier, 300; Stormont, 300; Ovens, 150; Lawrencetown, 50; from *Alluvial*—Tangier, 250; Ovens, 1700; Lawrencetown, 50. The two last localities are included under the head of Unclassified Districts, which embraces many scattered places where gold mines have been opened but never wrought with any persistency.

The most important results, as shown by the above table, have been obtained in the Sherbrooke district, owing less to any exceptional richness of its quartz than to a more regular method of working. It will be seen, too, that while in Montagu, Oldham, and Stormont, the average per ton of quartz is higher than at Sherbrooke, the extraction has been less profitable, a larger expenditure of labor being required to raise a ton of quartz in those districts. The returns from the "Unclassified" districts afford no basis for calculations, but taking the average wages as not below £80 annually per man, seven districts appear to have given a good margin in excess of wages towards plant and dividends, two to have produced slightly in excess of, and only one not to have earned, labor cost.—*Heatherington's Mining Industries of Nova Scotia.*

## Extracts from a Report on Panamint Mining District.

CONTINUED FROM PAGE 259.

The branch vein, however, shows much more ore than the main vein, and contains pay streaks several feet wide. No work has been done on the main ledge. On the branch (475 feet above Rain's camp) an incline, 55 feet long, has been sunk to the foot wall of the main ledge, but without penetrating further. This incline shows barren quartz at its bottom. But the Mexicans, who did the work, have done it without sense. Instead of going down on the foot wall, they ran the incline through the quartz near the hanging wall, and after a while left it altogether and pushed the roof of the incline in limestone, probably to get easier work. A few cuts West of the incline show very rich ore.

B. STEWART'S WONDER.

There is another break in Stewart's Gulch, and the disturbance here is much greater than in Jacob's Gulch (same altitude as Rain's camp). No croppings appear in the gulch to the West opposite the Stewart's Wonder croppings; they are found again, however, some distance to the North in the Challenge. Stewart's Wonder claim (1500 feet) runs Northeast from the gulch, the vein taking here a northeast course. The croppings show very prominent, and from four to 7 feet wide, nearly to the top of the ridge, where an incline has been sunk. In the gulch the quartz is perfectly barren, but higher up an ore chimney commences, which I estimate to be 350 to 500 feet long. Near the incline (530 feet above Rain's camp) to the Northeast, dark colored limestone and slate commence, and the vein splits into three distinct branches, which carry for some distance very good ore, but become barren in the slate. The incline, about 20 feet deep, sunk on one of these branches, shows near the surface a ledge 5 to 6 feet wide, dipping Northwest with a pay streak 2 feet wide, the rest being barren quartz. Lower down a wedge of limestone separates the pay streak from the barren quartz, and at the same time the pay streak widens considerably over 3 feet.

THE MARVEL—WYOMING.

Next to the Wonder, the Marvel, located on the South slope of Surprise Cañon, is the most prominent vein of the district, and, if we consider the Surprise to be on the same vein, the Marvel is nearly as extensive in length as the Wonder. Marvel Gulch is the deepest and longest of the intersections on the south slope of Surprise Cañon. The formation here is less regular, and the disturbances greater than in other gulches.

The croppings of the Marvel exposed in the gulch are huge and exceedingly barren. Near the summit to the East I measured them and found a width of 20 feet. On the summit, (1700 feet above Rain's camp) however, they split up into a number of thin stringers intersected by a number of barren little cross veins. Descending a short distance to the head of Little Chief Gulch, the Wyoming claim commences. Here we find very rich croppings, (1600 feet above Rain's camp), from 5 to 6 feet wide. These croppings continue ore bearing to the Northeast, but only in a width of 2 to 3 feet, over the next ridge, which divides Little Chief from Stern's Gulch. I estimate the length of this ore chimney to be from 300 to 350 feet. A short distance below the ridge, (1600 feet above Rain's camp), at the northeast end of the ore chimney, a tunnel about 100 feet long has been run in a southwest direction on the ledge. This tunnel shows for about 20 feet from its mouth a streak of rich ore 6 to 8 inches wide. In progressing further Southwest the vein widens to 3 feet. During this whole distance the quartz is mostly barren. Above the tunnel are bold croppings. In the vicinity of the tunnel the limestone is dark colored, and to the Northeast we find slate. This accounts for the barren nature of the vein in the tunnel. The Wyoming croppings appear again on the ridge on the other side of Stern Gulch but are barren and split up.

OPENING THE MINES.

From the topographical description of Surprise Cañon, it will be evident that a splendid opportunity is offered to open the mines by tunnels. Apart from other advantages, this would save the expense of constructing expensive tramways and roads for the conveyance of the ore and supplies.

WORKING THE ORE.

The Panamint ore is admirably suited for amalgamation, but it must first be roasted.

In conclusion I will remark that it is rarely the good fortune of a mining ing engineer to form so favorable a judgment of an entirely undeveloped district as I feel justified in expressing in regard to the mines of Panamint District.

## Prices of Cumberland Coal for Twenty Years.

WE clip from *Seward's Journal* the following table. It gives the average price of Cumberland coal at Baltimore for each year since 1853, and what may be considered as average rates of freight from Baltimore to Boston. This added together gives the price of coal delivered in Boston.

The price for 1874 is put at $1 65 per ton in Baltimore. This is somewhat above the actual average selling price, which has been for many months about $1 60. The Cumberland coal is constantly growing in favor, and taking the place of anthracite in many industries; in fact, as a steam generator it is fully equal to the very best anthracite and superior to most of those in the market:

| Year. | Average for year. | Av. freight to Boston. | Average cost delivered in Boston. |
|---|---|---|---|
| 1853 | $3 30 | $2 80 | $6 10 |
| 1854 | 4 05 | 2 25 | 6 30 |
| 1855 | 3 89½ | 2 17 | 6 06 |
| 1856 | 3 75 | 2 37 | 6 12 |
| 1857 | 4 28 | 1 84 | 6 12 |
| 1858 | 3 70 | 1 73 | 5 43 |
| 1859 | 3 63 | 1 83 | 5 46 |
| 1860 | 3 49 | 2 55 | 6 04 |
| 1861 | 3 44 | 2 25 | 5 69 |
| 1862 | 4 23 | 2 42 | 6 65 |
| 1863 | 5 57 | 3 28 | 8 85 |
| 1864 | 6 84 | 3 39 | 10 23 |
| 1865 | 7 57 | 3 79 | 11 36 |
| 1866 | 5 94 | 3 53 | 9 47 |
| 1867 | 4 97 | 2 68 | 7 65 |
| 1868 | 4 71 | 3 21 | 7 92 |
| 1869 | 4 97 | 2 83 | 7 80 |
| 1870 | 4 72 | 2 64 | 7 36 |
| 1871 | 4 72 | 2 73 | 7 45 |
| 1872 | 4 66 | 3 06 | 7 72 |
| 1873 | 4 84 | 3 17 | 8 01 |
| 1874 | 4 65 | 1 50 | 6 15 |

## Notes.

Wages have been cut down at the Lucy furnace, commencing the 1st inst., as follows: Keepers, $2.50; helpers, $2.00; barrowmen, $1.75; metal-carriers, $2.00; cindermen, $1.50; laborers, $1.50; engineers, $2 50; firemen, $2 00; tap-chargers, $1 80.

**New Coal Fields.**—The building of the Wheeling and Lake Erie Railroad has developed an immense coal field of the Masillon variety on Pigeon Run. The seam varies in thickness from four to six feet, and is remarkable for the purity of its composition and its excellence as a furnace fuel in the raw state. The farms on which the discoveries have been made are already leased to strong coal men, and would sell to-day for $200,000 more than they would have done a year ago. Five experienced drilling parties are constantly at work, and more extensive discoveries are expected with the utmost certainty this fall. The distance of this coal field from Toledo is less than 120 miles by the line of the Wheeling and Lake Erie Railroad. The work on this road is rapidly progressing, and will be pushed to a speedy completion.

**Paterson.**—The Passaic Rolling-mill was badly damaged yesterday by the bursting of the fly-wheel, which is a mass of metal 24 feet in diameter, weighing 27 tons. The beam that was going through the rollers had a ragged end, and it got across the "collar," throwing a strain of 240 horse-power on the spindle that connects the roller with the engine, breaking it and freeing the fly-wheel, which increased its velocity from 65 to 300 revolutions a minute, bursting it at once. One of the segments, weighing three tons, went through the roof and demolished a large iron crane in its descent. Another piece of about the same size went through the roof and fell into the mill, about 300 feet away, making two large breaks in the roof. Yet another piece fell on a cart in the yard and demolished it, but did not injure the horse or driver. Over 100 men were working in the mill, and their escape without injury was almost miraculous. The mill will be closed for two weeks to make repairs.

## COAL TRADE REVIEW.

### Import Duty on Coal.

*Anthracite* free. *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c. gold.

*This is the only report published that gives full and accurate returns of the production of our Anthracite mines.*

NEW YORK, Oct. 23, 1874.

**The Production of Anthracite Coal** for the week ending Oct. 17, 1874, was as follows:

| Tons of 2240 lb. | WEEK. Tons. | YEAR* Tons. |
|---|---|---|
| *Wyoming Region.* | | |
| Delaware and Hudson Canal Co | 54,841 | 1,878,118 |
| Delaware, Lackawanna and Western R.R | 55,186 | 1,981,101 |
| Pennsylvania Coal Co | 26,479 | 1 059,241 |
| Lehigh Valley R.R | 22,414 | 759,908 |
| Pennsylvania and New York R.R | 1,578 | 49,274 |
| Central Railroad of New Jersey | 41,578 | 1,148,352 |
| Sold at the mines by L. & W. C. Co | 769 | 16,661 |
| | 202,845 | 6,892,655 |
| *Lehigh Region.* | | |
| Lehigh Valley R.R | 72,876 | 2,518,244 |
| Central Railroad of New Jersey | 30,133 | 920,337 |
| Danville, Hazleton & W. B.R.R., | 789 | 32,749 |
| | 103,798 | 3,471,330 |
| *Schuylkill Region.* | | |
| Philadelphia and Reading R.R | 171,799 | 4,049,463 |
| Shamokin and Lykens Valley | 27,020 | 734,112 |
| | 198,819 | 4,783,675 |
| *Sullivan Region.* | | |
| Sullivan and Erie R.R | 665 | 29,347 |
| Total of all the regions | 506,127 | 15,176,907 |

* Year beginning Jan. 1.

*The following table does not give the entire production of our bituminous mines, but it is by far the fullest report published.*

**The Production of Bituminous Coal** for the week ending Oct. 17, was as follows:

Tons of 2000 lb., except where otherwise designated.

| | Week. Tons. | Year. Tons. |
|---|---|---|
| *Cumberland Region, Md.* | | |
| C. & P. and C. B. R.R.'s, tons of 2240 lb | 49,437 | 1,837,545 |
| *Barclay Region, Pa.* | | |
| Barclay R.R. tons of 2240 lb | 6,634 | 242,933 |
| *Broad Top Region, Pa.* | | |
| Huntingdon & Broad Top R.R | 3,359 | 181,195 |
| *Clearfield, Region, Pa* | | |
| Snow Shoe | 1,177 | 47,556 |
| Tyrone and Clearfield | 16,606 | 494,399 |
| *Allegheny Region, Pa.* | | |
| Pennsylvania R.R | 3,948 | 166,027 |
| *Pittsburgh Region, Pa.* | | |
| West Penn. R.R | 3,549 | 154,125 |
| Southwest Penn. R.R | 247 | 6,057 |
| Penn and Westmoreland gas coal, Pa. R.R. | 15,899 | 707,440 |
| Pennsylvania R.R | 10,530 | 366,128 |
| *Kanawha Region, W. Va.* to Oct. 10. | | |
| Chesapeake and Ohio R.R | 2,475 | 108,879 |
| Shipments from *Block House Region, N. S.*, to Oct. 10. | | |
| Consigned to the Provinces, tons 2240 lb | 1,794 | 12,991 |
| " " " United States " " " | .... | 13,973 |
| Shipments from *Pictou Region, N. S.*, to Oct. 10. | | |
| Consigned to the United States tons 2240 lb. | 894 | 46,967 |
| " " " West Indies " " " | 2,313 | 9,763 |
| " " Canada " " " | 1,800 | 91,090 |
| " " other provinces " " " | 4,582 | 59,707 |

**The Production of Coke** for the week ending Oct. 10.
Tons of 2000 lb.

| | Tons. | Year. Tons. |
|---|---|---|
| Tyrone and Clearfield | 41 | 633 |
| West Penn. R.R., " " " " | 1,246 | 11,606 |
| Southwest Penn. R.R " " " " | 10,372 | 325,164 |
| Gas Coal, Penn. R.R. " " " " | 1,020 | 29,910 |
| Pittsburgh Coal, Penn. R.R. " " " | 1,284 | 53,397 |

The production of Anthracite for the week ending Oct. 17th was as follows: Wyoming Region 202,845 tons, being 7,815 tons more than the preceding week. In the Lehigh region, 103, 98 tons, or 8,595 tons less than the week before, and in the Schuylkill region, 198,819 tons, being 17,466 tons more than the preceding week.

The total production of Anthracite from all the regions was

for the week 506,127 tons, as against 489,242 tons the preceding week, (or an increase of 16,885 tons), and 468,975 tons for the corresponding week last year. From January 1st to Oct. 17th, there were produced 15,176,905 tons, as against 16,289,599 tons for the same period last year. The figures of last year's production are taken from the Pottsville *Miners' Journal*.

The production of Cumberland coal from January 1 to Oct. 17, inclusive, was 1,837 545 tons of 2240 lb., against 1,988,704 tons to the corresponding date in 1873. The production for the week was 49,437 tons, as compared with 66,271 tons for the corresponding week in 1873. This is a total decrease for the week of 16,834 as compared with 1873, and for the year, thus far, of 151,159 gross tons.

The Delaware and Hudson Canal Company has on stock at Honesdale 90,000 tons, at Rondout 54,000, and at Weehawken, 8,000 tons.

The receipts at Port Richmond were 72,000 tons; shipments, 58,000 tons; and balance on hand 92,000 tons.

Returns from Greenwich, Philadelphia:

| | Bituminous. | Gas Coal. |
|---|---|---|
| Receipts | 4,459 | 1,035 |
| Shipments | 4,980 | 2,431 |
| On hand | 2,302 | 633 |

Exports of coal from Baltimore from 1st January to 1st September, 61,787 tons as against 52,756 tons in the same time last year.

Imports of foreign coal at New York this year, 75,367 net tons, as compared with 127,790 tons last year to same date.

| | week. | year 1874. | year 1873. |
|---|---|---|---|
| The receipts of coal at Coal Port (Trenton) | 7,249 | 226,015 | 293,292 |
| " " " South Amboy | 11,482 | 499,335 | 387,524 |
| Shipments at Coal Port (Trenton) | 7,606 | 225,893 | 296,750 |
| " South Amboy | 14,491 | 507,748 | 374,241 |

The receipts of coal by the Michigan Southern RR. at Buffalo for the week were 6,025 tons. Receipts by Lake, 1,086 tons. The shipments by Lake, 16,716 tons.

*Freights* on coal from Buffalo to Milwaukee, 40 cents.

The receipts of bituminous coal at Erie, Pa., average 2000 tons per day, and the total receipts to Oct. 21st amount to 210,000 tons. Shipments the same. *Freights via Lake* to Chicago and Milwaukee, 60 cents free in and out. To Buffalo, 50 cents, and to Canadian ports $1 10 to $1 25.

### Production of Bituminous Coal, 1874.

| Tons of 2000 lb. | 8 months. | Sept. | 9 months. |
|---|---|---|---|
| Blossburgh Region | 538,751 | 92,700 | 631,451 |
| Barclay Region | 223,525 | 36,140 | 259,665 |
| Broad-Top Region | 154,941 | 19,516 | 174,457 |
| Cumberland Region | 1,681,033 | 261,750 | 1,942,783 |
| Clearfield Region | 450,483 | 57,216 | 507,699 |
| Alleghany Region | 144,020 | 14,834 | 158,854 |
| *Pittsburgh Region.* | | | |
| West Penn. RR | 130,179 | 15,292 | 146,471 |
| Southwest Penn. RR | 4,879 | 601 | 5,480 |
| Gas Coal, Penn. RR | 616,505 | 50,309 | 676,814 |
| Pittsburgh Coal, Penn. RR | 297,155 | 47,580 | 344,735 |
| Saw Mill Run RR | 68,957 | .. | 68,957 |
| Cleveland and Pittsburgh RR | 172,419 | 25,535 | 197,904 |
| Pittsburgh, Cincinnati and St. Louis RR | 404,175 | 26,865 | 431,040 |
| Erie and Pittsburgh RR | 167,354 | 34,209 | 201,563 |
| Pittsburgh, Fort Wayne and Chicago RR | 146,720 | 12,653 | 159,373 |
| Castle Shannon RR | 77,601 | .. | .. |
| Pittsburgh and Connellsville RR | 262,373 | 33,732 | 296,105 |
| Monongahela Nav. Co | 1,835,109 | 13,547 | 1,848,656 |
| Keeling & Co | 111,920 | 1,260 | 113,180 |
| Wettengal & Gormley | 5,848 | .. | 5,848 |
| *St. Louis Region.* | | | |
| Tenn. Coal & R.R. Co. to Aug. 1 | 51,728 | .. | .. |
| St. L. A. & T. H. R. R. Belleville Branch | 112,799 | .. | .. |
| B. & S. J. R.R. | 63,940 | .. | .. |
| Indiana North and South RR | 3,336 | .. | .. |
| Evansville & Crawfordsville RR | 8,333 | .. | .. |
| *Kanawha Region.* | | | |
| Chesapeake and Ohio RR | 94,465 | 12,144 | 106,609 |
| *Warrior Region, Ala.* | | | |
| South and North Alabama RR | 14,585 | 1,875 | 16,460 |
| *Cahaba Region, Ala.* | | | |
| South and North Alabama RR | 2,765 | 320 | 3,085 |
| S. R. & B. R.R. | 9,370 | 1,485 | 10,855 |
| Chicago B. & Q. R.R | 244,289 | .. | .. |
| B. & M. R.R | 64,754 | .. | .. |
| | 8,164,311 | | |

There is no change to note in the condition of the coal trade, either in anthracite or bituminous. There is a brisk demand for stove and chestnut coal, but the larger sizes are still heavy, and the announcement of the offer of 60,000 tons at the usual Scranton sale on the 28th inst., is sufficient indication of the difficulty there is in placing the present output of our mines. The programme advance of 15 cents per ton in November has been announced, and there is every prospect of the programme output being reduced at least 30 per cent. for November. A few of the dealers report greater activity in the demand, but in general the trade is much more stagnant than is usual at this season of the year. The trade is gradually running into fewer channels; a number of middle-men have already gone out of the business, and others will soon follow. Although the public seems to prefer buying from middle-men to dealing with the large companies, the dullness of business and closeness of margins have discouraged many, and their trade has fallen into the hands of the stronger firms. Such well-known and popular dealers as FRED. A. POTTS, DEMOLD & CO., E. A. PACKER, and E. B. ELY & Co., have absorbed a large share of this business.

We give this week a table, to which we are constantly adding, showing the amount of bituminous coal mined this year in the most important of our coal regions. Our statistics, both of anthracite and bituminous coal, are obtained at the expense of much labor, and no trouble is spared to make them full and correct. Most of our exchanges willingly extend the usual courtesy of giving us credit for them when they copy from us, but courtesy appears to have no place in the ethics of *Sawa-d's Journal*, which copies, week after week, without credit.

Our bituminous coal reports show a very heavy falling off in the output during the last three months, indeed a steady reduction has been going on from the beginning of the year on nearly every line reporting, and at the same time we are advised by our correspondents from nearly all parts of the country that wages are being reduced at the mines. Near Pittsburgh, we learn that the Italians recently put in the mines there are giving satisfaction, and are mining at 3 cents per bushel. The Waverly Company (Youghiogheny) is again at work, the men having failed in their strike. At this colliery the coal is mined probably at a less cost than at any other in the country, the men receiving, we have been informed, but *two* cents per bushel. It is claimed that, owing to the unusual facilities for mining, the men can make at least as good wages as those receiving 3 and 3¼ cents per bushel elsewhere in the Pittsburgh region.

In the Cumberland Region the output is falling off quite rapidly and the prospect is that the business will, by the end of the year, fall short of last year's by nearly a quarter of a million tons.

The *Cumberland Times* has given still another version of Mr. MCCARDELL'S share in the late boatmen's strike

Mr. MCCARDELL must have lost his file of the *Times*, for his stories "don't hang well together." We append, for his convenience, extracts from his three versions of the same fact.

It will be borne in mind that Mr. MCCARDELL is the Editor and Proprietor of the *Cumberland Times*, from which we quote:

27th August.

"Mr. MCCARDELL continued at some length, advising the boatmen as to their course, and when he concluded the following resolution was adopted without a dissenting voice:

"*Resolved*, That we will not load, nor allow any parties to load, at a less freight than $1 35 to Georgetown, and $1 40 to Alexandria, and that there shall not be any drawback or bonus paid for loading."

October 5th.

Mr. MCCARDELL says this is nothing but "*a glaring falsehood*," for, he says, "the boatmen have passed no such resolution."

October 15th.

Mr. MCCARDELL says: "We were not the leading spirit in the late strike of the boatmen. We did not advise the adoption of the resolution (annexed). After the election we will take the articles in the Journal and show how utterly unfounded their assumptions are."

First MCCARDELL says that after his advice the boatmen passed the resolution, then he says, no such resolution was ever passed, then that such a resolution was passed, but he did not advise it. Those interested can take what version they please. We give the facts. The *Times* can easily see at the head of our columns who edits this paper, and Mr. HENRY LOVERIDGE has not, we regret to say, contributed to our columns; he could doubtless add points of much interest regarding the management of the Cumberland Coal Trade. We do not complain of the boatmen's demand for higher wages, though we do of the form in which they made it. All their profits, along with no small part of those of some of the coal companies, are absorbed by others. Mr. MCCARDELL ought to know very well how the thing is done, and he would gain the thanks of honest men, and save us some trouble if he would tell us just where the leaks are which let out the profits of some of the Cumberland companies, between the miners and the stockholders.

***Wholesale Prices for Oct. of Anthracite f.o.b., at the Tide Water Shipping Ports per ton of 2240 lb.***

| | Lump. | Steamer. | Grate. | Egg. | Stove. | Chestnut. |
|---|---|---|---|---|---|---|
| **Wyoming Coals.** | | | | | | |
| †Lackawanna and Scranton at Elizabethport & Hoboken | 5 40 | 5 50 | 5 60 | 5 75 | 6 25 | 5 20 |
| ‡Pittston at Newburgh | 5 00 | 5 00 | 5 10 | 5 30 | 5 75 | 4 70 |
| Wilkesbarre at Port Johnston | 5 40 | 5 50 | 5 60 | 5 75 | 6 25 | 5 20 |
| Plymouth, R. A | .... | .... | 5 60 | 5 75 | 6 35 | 5 20 |
| Susque. Coal Co. at Amboy W.A. | 5 40 | 5 50 | 5 60 | 5 75 | 6 35 | 5 20 |
| Kingston at Hoboken | 5 40 | 5 50 | 5 60 | 5 75 | 6 25 | 5 20 |
| **Lehigh Coals.** | | | | | | |
| Old Company at Port Johnston | 6 35 | .... | 6 30 | 6 30 | 6 45 | 5 50 |
| Old Company's Room Run " | 5 85 | .... | 5 85 | 5 85 | 6 20 | 5 20 |
| Sugar Loaf at " | 6 35 | .... | 6 30 | 6 30 | 6 30 | 5 35 |
| Lehigh Coal Exchange " | 6 20 | .... | 6 15 | 6 15 | 6 30 | 5 35 |
| Honey Brook at Elizabethport | 6 20 | .... | 6 15 | 6 15 | 6 30 | 5 35 |
| Spring Mt. C. Co. at Hoboken | 6 20 | .... | 6 15 | 6 15 | 6 30 | 5 35 |
| Beaver Meadow at South Amboy | 6 20 | .... | 6 15 | 6 15 | 6 30 | 5 35 |
| **Schuylkill Coals at Port Richmond.** | | | | | | |
| Schuylkill white ash | 4 90 | 5 00 | 5 10 | 5 25 | 5 75 | 4 30 |
| Schuylkill red ash | .... | .... | 5 25 | 5 35 | 5 80 | 4 40 |
| Shamokin white and red ash | .... | .... | .... | 5 25 | 5 80 | 4 45 |
| N. Franklin | .... | .... | 5 70 | 5 70 | 5 75 | 4 45 |
| Lorberry | .... | .... | 6 05 | 6 05 | 6 05 | 4 65 |
| Lykens Valley | .... | .... | .... | 6 70 | 6 70 | 5 25 |

* Prices for November have been fixed 15 cents per ton above these rates.

† f.o. b. in New York Harbor.

‡ These are the rates for Pittston coal on registered contracts only. Buyers not having contracts will be charged 15 cents per ton in addition to the above prices.

### *Retail Prices.*

per 2000 lb. are as follows:

| Grate and Egg. | Stove. | Chestnut. |
|---|---|---|
| Pittston coal, in yard | $6 00 | $6 20 | $5 40 |
| Delaware & Hudson, delivered | 7 35 | 7 60 | 6 85 |
| Scranton, in yard | 7 25 | 7 50 | 6 80 |
| Wilkes-Barre, delivered | 7 10 | 7 35 | 6 60 |
| Lehigh & Locust Mountain, | 7 50 | 8 00 | 7 00 |
| Schuylkill Red Ash | 8 25 | | |
| Cumberland | 8 00 | | |

| Freight from Hoboken and Weehawken to New York | Per ton. 40c. |
|---|---|
| " " Elizabethport & Port Johnston to New York | 40c. |
| " " South Amboy to New York | 45c. |
| " " Newburgh to New York | 65c. |
| " " Port Richmond, "Phila." to N. Y. alongside | 95c. |
| " " Rondout to New York by boat or barges of the D. & H. Canal Co. "delivered" | 50c. |

### *Cargo Prices of Bituminous Coal.*

*Domestic Gas Coals.*

| Per ton of 2240 lb. | At the Shipping Ports. | Alongside in New York. |
|---|---|---|
| Westmoreland and Penn, at Greenwich, Philadelphia | $6 25 | $7 65 |
| " " at S. Amboy | 7 00 | .... |
| Red Bank Cannel Pa., at Phil | 8 50 | 9 50 |
| " " at S. Amboy | 9 00 | .... |
| " Orrel, " | 7 00 | 7 65 |
| " " at Philadelphia | 6 25 | .... |
| Youghiogheny, Waverly Co, at Baltimore | 6 00 | 7 65 |
| Despard, West Va., " | 5 50 | 7 40 |
| Murphy Run, W. Va. at Baltimore | 5 50 | 7 40 |
| Fairmount, W. Va " | 5 50 | 7 40 |
| Newburgh Orrel, Md. " | 5 50 | 40 |
| Cannelton Cannel, W. Va., at Richmond. | 11 00 | 12 60 |
| " Splint, " " | 5 50 | 7 50 |
| Peytona Cannel, " " | .... | 12 50 |
| Sterling " Ohio | .... | 14 00 |
| Straitsville, " Lyonsdale Cannel | .... | 11 50 |
| At Sandusky, O | 3 90 | .... |

FOREIGN GAS COALS.

| | Sterling. | Am. cur'cy. |
|---|---|---|
| Newcastle, at Newcastle-on-Tyne | 12/@13/6 | 7 00@ 8 00 |
| Liverpool House Orrel, at Liverpool | 29/ | 13 00 |
| Ince Hall Cannel " | 52/ | 18 00 |
| " Gas Cannel " | 40/ | 15 00 |
| Scotch Gas Cannel, at Glasgow, nominal. | 28/ | 9 50 |
| | Gold. | |
| Block House, at Cow Bay, N.S. | 2 25 | 6 50 |
| Caledonia, at Port Caledonia | 1 87½ | 5 70 |
| Glace Bay, at Glace Bay | 2 00 | 5 50 |
| Lingan, at Lingan Bay | 2 25 | 6 50 |
| Sydney, International and Reserve mines, at Sydney | 2 25 | 5 75 |
| Pictou, Albion and Vale mines, at Pictou | 2 50 | 6 50 |

STEAM AND HOUSE COALS.

| | | |
|---|---|---|
| Broad Top, at the mine, $1 25; at Port Richmond, Phil | 4 75@5 00 | 6 00@6 25 |
| Cumberland, at Georgetown and Alexandria, Va | 4 30@4 40 | 5 75@6 00 |
| Cumberland at Baltimore | 4 60@4 75 | 6 25@6 50 |
| Clearfield, "Derby," "Kittanning" and "Sterling," at the mines, $1 25; at Greenwich, Phil | 4 75@5 00 | 6 25 |
| James River, carbonite, at Richmond, Va " bituminous, " | 6 75 / 4 00 | 9 00 / 6 25 |
| Schooner freights to New York are | | $1 25 |
| Barge " " " " | | 1 65 |

### *Retail Prices in New York.*

Per ton of 2000 lb.

| | |
|---|---|
| Liverpool House Orrel | $20 00@22 00 |
| Liverpool House Cannel | ....@25 00 |
| American Block | 16 00@ .... |
| Straitsville Cannel | 16 00@.... |
| Carbonite | 12 00@ .... |

### Coal Trade of Philadelphia.

PHILADELPHIA, Oct. 21, 1874.

***Bituminous Coal, Wholesale.***

| | |
|---|---|
| Penn. and Westmoreland (Gas), f.o.b., Greenwich | 6 25 |
| Broad Top, (according to destination) f.o.b., Port Richmond | 4 75@5 00 |
| Clearfield f.o.b. at Greenwich, according to destination | 4 75@5 00 |

***Bituminous, Retail.***

$6 60 in yard, per 2240 lb., cartage added.

***Anthracite, Retail.***

Egg, per 2240 lb., $6 20; Stove, $6 25; Chestnut, $5 10; delivery costs, 75 cents extra.

### Baltimore, Md.

Oct. 21, 1874.

Reported by our Special Correspondent.

WHOLESALE PRICES PER 2240 LB.

ANTHRACITE.

| | afloat. | at depot. |
|---|---|---|
| *Wilkes-Barre, "Lee," or "Diamond,"* | | |
| Lump, steamboat | $5 00 | $5 40 |
| Broken | 5 25 | 5 50 |
| Egg | 5 62 | 5 90 |
| Stove | 5 82 | 6 10 |
| *Pittston and Plymouth.* | | |
| Lump, steamboat, and broken | .... | 5 45 |
| Egg | .... | 5 80 |
| Stove | .... | 6 00 |
| Lykens Valley, red ash, all sizes | 6 00 | 6 30 |

From wharf or yard, wholesale, 50@75c. additional. By retail, all kinds and sizes, per 2,240 lb, $7@8 00.

BITUMINOUS.

| | | |
|---|---|---|
| George's Creek and Cumberland f. o. b. at Locust Point for cargoes | 4 60 | 4 75 |
| West Va. Gas Coal f. o. b. at Locust Point | 5 50 | .... |
| Kanawha Cannel, coarse | 13 00 | .... |
| Tyrone | 7 25 | .... |
| Ritchie Mineral of West Virginia | 1 00 | .... |

### Boston.

Oct. 21, 1874.

Reported by our special correspondent.

CARGO PRICES TO TRADE.

| | | | |
|---|---|---|---|
| Lingan coal | $5 75 | Westmoreland | 7 75 |
| Caledonia | 5 10 | Waverly Co. Youghiogh'y | 7 75 |
| Pictou | 6 15 | Cannelton Cannel | 13 50 |
| Block House | 5 60 | Cumberland | 5 90@ 6 20 |
| Red Bank Cannel | 10 00 | Anthracite, | 6 50@ 7 00 |
| Glace Bay | 5 40 | " Retail | 8 00 |
| Sydney | 7 25 | | |

From the *Commercial Bulletin* of October 17.

Anthracite is more active from yard. The sharp frost of the early days of the week quickened the necessities of households

and stores. The dealers from the outposts have been in and placed a number of orders to arrive before the close of navigation, while six of our nearby foundries have been talking to the trade in a sort of willing speculative turn of mind. Two or three cargoes have been placed in this direction. The rumor is credited that the Combination have settled an arrangement to hold according to the first circular issued until March next.

Bituminous is rather quiet. The gossip of the street has turned to the item of the sale of a 1000 ton cargo Cumberland to the Hartford and Erie road at $5 50; a sacrifice few credit. A cargo of Peytona cannel comes upon the market, competing with the English.

### Buffalo, N. Y. Oct. 21, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb.

| | Slack. | Nut & Slack. | Nut. | Lump |
|---|---|---|---|---|
| Connelsville coke | | | | 6 50 |
| Sterling cannel | | | | 6 00 |
| Red Bank | | | | 5 75 |
| Youghiogheny coal for gas | | | | 5 50 |
| Briar Hill coal | | 3 25 | | 5 00 |
| Fairmount " | | 3 25 | 3 50 | 4 25 |
| Catfish " | | 3 25 | 3 75 | 4 50 |
| Stoneboro " | 2 75 | | 3 50 | |

Briar Hill coal, and Stirling and Red Bank cannels, at $8; all other coals $1 per ton above wholesale prices.

Anthracite f. o. b. vessel. Retail prices delivered and screened, $1 per ton additiona

| | | | |
|---|---|---|---|
| Grate | 6 70 | Stove | 7 00 |
| Egg | 6 70 | Chestnut | 5 60 |

### Chicago, Ill. Oct. 19, 1874.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

No change in prices of coal. Retail city trade good.

Retail prices per ton of 2000 lb. delivered to buyer.

| | | BITUMINOUS. | |
|---|---|---|---|
| Lehigh Lump | $10 75 | Briar Hill and Erie | 7 50@ .... |
| Lehigh prepared and car load lots | 9 75 | Walnut Hill (W. Va.) | 6 50@ .... |
| | | Midway (West Va.) | 6 50@ .... |
| Lackawanna, Wilkes-Barre and Pittston,* | | Cannel | 8 00@ 9 00 |
| | | Blossburg | 8 00 |
| Grate, egg, and chestnut. | 9 00 | Indiana Block | 6 00 |
| Stove or range | 9 50 | Hocking " Brooks" | 6 00 |
| | | Wilmington and Illinois | 5 00 |

*75 cents off these prices for car load lots to country dealers and manufacturers.

### Cleveland, O. Oct. 21, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb.

| | | | |
|---|---|---|---|
| Youghiogheny, l'p, f.o.b. | $4 65 | Straitsville, f.o.b. | $3 40 |
| Youghiogheny, nut | 3 60 | Columbiana " | 3 40 |
| Briar Hill, (Church Hill) | 4 25 | Strip Vein | 3 65 |
| " " (Brookfield) | 4 10 | Mountain Blossburg | |
| Massilon, according to quality | $3 40 to 3 65 | (blacksmith), f.o.b. | 5 75 |
| Hocking Valley, f.o.b. | 3 50 | Darlington and Sterling Cannel, f.o.b. | 4 50 |
| Anthracite, Lackawanna on cars, | | Egg | $6 85 |
| " " " " | | Stove | 7 30 |
| " " " " | | Chestnut | 6 90 |
| Youghiogheny Coke, | " " | here | 5 50 |
| Connellsville " | " " | " | 5 75 |

### Cincinnati, O. Oct. 20, 1874.

Specially reported by Messrs. A. BUCHANAN & Co., wholesale and retail dealers in coal and coke.

We report prices here same as last week. The Pittsburgh coal in this market has all been bought by the retail dealers, which gives the market a very firm tone, and prices inclined to be higher.

Per ton of 2000 lb.

| | Bush. | Ton. |
|---|---|---|
| Youghiogheny, or Pittsburgh, afloat | 13 c. | $2 86 |
| Pomeroy coal | 8 c. | |
| Cannel coal | 18c. | 4 68 |
| Semi Cannel | 11 c. | 2 60 |

The following are retail prices delivered:

| | |
|---|---|
| Youghiogheny | 18 c. — $3 90@$ |
| Pomeroy | 14 c. — |
| Cannel | 24 c. — |
| Kanawha Semi Cannel | 15c. — |
| Anthracite | $9 50@11 00 |
| Foundry coke | 12c. — |
| Soft coke | 10c. — |

### Detroit, Mich. Oct. 20, 1874.

Specially reported by Messrs. ROBINSON & KEYS, dealers in all kinds of coal.

Trade continues fair for this season, though not quite as brisk as last reported. Prices remain unchanged.

Per ton of 2000 lb.

| | | | |
|---|---|---|---|
| Lehigh Lump, per ton | $10 50 | Blossburg | 8 50 |
| Lehigh " prep. sizes. | 9 50 | Briar Hill | 7 50 |
| Wilkes-Barre, Grate and Egg | 8 50 | Willow Bank | 7 00 |
| | | Erie | 7 50 |
| Wilkes-Barre, Stove and Nut | 9 00 | Massillon | 7 00 |

### Erie, Pa. Oct. 21, 1874.

Reported by our Special Correspondent.

Wholesale, per ton of 2,000 lb.

Bituminous f.o.b.

| | | | |
|---|---|---|---|
| Briar Hill lump | $4 00 | Beaver lump | $4 00 |

### Indianapolis, Ind. Oct. 20, 1874.

Specially reported by Messrs. H. McCOY & Co.

Quotations remain unchanged.

Per ton of 2000 lb.

| BITUMINOUS. | | | |
|---|---|---|---|
| Best Block coal | $2 90 | Indiana cannel | 6 50 |
| Best Highland | 2 40 | Hocking Valley | 3 00 |
| Block Nut | 1 65 | Youghiogheny | 5 42 |
| Highland " | 1 65 | Blossburg (smithing) | 7 30 |
| Block slack, per car load | 15 00 | Piedmont " | 7 75 |
| Peytona, cannel per ton | 8 50 | Gas coke, per bushel | 9½c |

| ANTHRACITE (Lackawanna). | | | |
|---|---|---|---|
| Grate | $8 70 | Chestnut | 8 60 |
| Egg | 8 70 | Stove | 8 85 |

Retail, per bushel of 70 lb.

| | | | |
|---|---|---|---|
| Block | 14c. | Peytonia Cannel | 32c. |
| Highland | 12 | Indiana " | 28 |
| Highland Nut | 9 | Youghiogheny | 25 |
| Block " | 9 | Blossburg | 27 |
| Slack | 7 | Piedmont | 30 |

| ANTHRACITE. per ton. | | per ton. | |
|---|---|---|---|
| Grate | $10 50 | Stove | $11 50 |
| Egg | 10 50 | Chestnut | 10 50 |

### Louisville, Ky. Oct. 20, 1874.

Specially reported by Messrs. BYRNE & SPEED.

Continue the following quotations.

| | |
|---|---|
| Pittsburgh, per load of 1900 lb | $4 00 |
| Pomeroy | |
| Buckeye Cannel | 5 50 |
| Peytona Cannel | 6 00 |
| Nut and Slack | 2 75 |
| Kentucky lump, per load | 3 50 |
| " nut, " | 3 00 |
| " Slack " | |
| City-made Coke, per bushel | 10c |
| Kentucky on cars at wholesale, per bush. | 10c |
| Anthracite, per ton | $10 to $10 50 |

### Milwaukee, Wis. Oct. 19, 1874.

Specially reported by Messrs. R. P. ELMORE & Co.

Our market still remains unchanged in price and we are still busy.

Retail prices per ton of 2000 lb.

| | | | |
|---|---|---|---|
| Lehigh Lump | $10 00 | Briar Hill, select | $8 50 |
| Lehigh Prepared | 10 50 | Blossburgh | 8 00 |
| Lackawanna | 9 50 | Pittsburgh | 7 50 |

### New Orleans, La. Oct. 17, 1874.

We have no material change to note in our market. The demand is limited and prices weak, with a good stock on hand. We quote:

| | |
|---|---|
| Pittsburgh coal, retail, per bbl | 75c. |
| " wholesale | 40c. |
| " to steamboats, per box | 60c. |
| " to manufacturers, per bbl | 65c. |
| " shipments per hhd | $7 00 |
| Anthracite, retail, per ton | $12 50 |
| " wholesale per ton | $9 00 |
| Spadra (Arkansas) coal, retail, per bbl | 75c. |
| Mt. Carbon, wholesale, per bbl | 45c. |
| " retail per bbl | 65c. |
| Virginia Cannel, per bbl | 90c. |
| Scotch Cannel, per bbl | 1 00 |

### Pittsburgh, Pa. Oct. 19, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb. and Bushel of 76 lb.

| | per ton. | | per ton |
|---|---|---|---|
| Youghiogheny coal | $2 15 | Pittsburgh retail delivered per bushel | 9c@10c |
| " coke | 2 75 | | |
| Connellsville coal | 2 25 | Anth'cite on cars Lehigh | $7 75 |
| " coke | 3 25 | " " Wilkes-Barre | 6 75 |
| Pittsburgh coal | 2 00 | | |

Twenty-five to fifty cents per ton additional for delivery.

### San Francisco.

From the *Commercial Herald*, October 8.

Imports of coal from January 1st to October 1st:

| | | | |
|---|---|---|---|
| Anthracite, tons | 7,665 | Vancouver Isl'd, tons | 39,750 |
| Australian, tons | 77,652 | Bellingham Bay, tons | 11,385 |
| Coos' Bay, tons | 36,785 | Rocky Mountain, tons | 323 |
| Cumberland, tons | 8,971 | Seattle, tons | 4,235 |
| English, tons | 10,608 | Mt. Diablo | 148,016 |

There is an improved tone to the general market, which may be attributed to the full supply of tonnage here and the low rates of freight ruling, which circumstances tend to discourage coal shipments to this port from New South Wales and elsewhere. The stock of Australian in yard is liberal, and Sydney cargoes on the spot and to arrive have recently been sold at a shade less than $10, although now held higher. Imports for the week have been liberal, amounting to over 10,000 tons of the various qualities, including small vessels from Coos Bay and other northern mines. There seems to be a great reticence respecting the reporting of cargo sales to the press, and it is therefore difficult at times to get at the facts required. We quote West Hartley by the cargo at $10 50@11, although retailing screened at $11 50@12. Wallsend sold to arrive at the close at $10 25.

### St. Louis, Mo. Oct. 19, 1874.

Specially Reported by the COLLINSVILLE COAL AND MINING COMPANY.

ANTHRACITE.

Per ton of 2000 lb.

| | City delivery. |
|---|---|
| Lehigh Lump | $13 50 |
| Lackawanna and Wilkesbarre | 12 50 |
| Semi Anthracite | 9 50 |

BITUMINOUS.

Per ton of 2000 lb.

| | E. St. Louis. | City delivery |
|---|---|---|
| Washington Indiana—smithing | $4 00 | $4 87 |
| O'Fallon, Ills | 2 00 | 3 00 |
| Collinsville and Belleville, Ills | 1 75 | 2 75 |
| Indiana Cannel | 6 00 | 7 00 |
| Missouri Cannel | | 5 00 |

Retail, 25c. per ton additional.

### Montreal. Oct. 19, 1874.

Reported by our Special Correspondent.

Per ton of 2,240 lb.

| | | | |
|---|---|---|---|
| Scotch Steam | $4 50@4 75 | Cape Breton Steam | $4 00 |
| Pictou " | 4 25 | Newcastle Smiths | 5 50 |

Anthracite at retail, 2,000 lb., delivered, less 5 per cent.

| | | | |
|---|---|---|---|
| Egg | $8 00 | Nut | $8 00 |
| Stove | 8 50 | Chestnut | 7 75 |

### Toledo, Ohio. Oct. 19, 1874.

Per ton of 2000 lb.

Specially reported by Messrs. GOSLINE & BARBOUR.

| Retail. | | Retail. |
|---|---|---|
| Wilkes-Barre and Scranton, | BITUMINOUS. | |
| Large and Small Egg, | $8 00 | Blossb'g and Cumberl'd, $8 00 |
| Stove | 8 25 | Massillon Lump | 6 00 |
| Chestnut | 8 00 | Briar Hill | 7 00 |
| Lehigh Lump | 10 00 | Straitsville | 3 75 |
| | | Hocking Valley | 4 00 |

### Halifax, N. S. Oct. 19, 1874.

Reported by our Special Correspondent.

No change since our last.

Prices per ton of 2240 lb. in gold.

| | | | |
|---|---|---|---|
| Sydney (old mines) | $4 75 | Little Glace Bay | 3 75 |
| Gowrie | 3 75 | Blockhouse | 4 00 |
| Victoria | 3 75 | Albion (at Railroad) | 4 25 |

### Toronto, Ont. Oct. 19, 1874.

Reported by our Special Correspondent.

The prices and terms of the Toronto Coal Exchange remain as follows:

| ANTHRACITE. per ton. | | per ton. | |
|---|---|---|---|
| Broken | $7 65 | Chestnut | $7 65 |
| Egg | 7 65 | Lehigh | 9 00 |
| Stove | 8 15 | | |

| BITUMINOUS. | | | |
|---|---|---|---|
| Blossburgh | 7 50 | Screenings | 5 00 |
| Briar Hill | 7 00 | Soft Nut | 5 50 |

## Rates of Transportation on Anthracite Coal to Tide Points.

| | |
|---|---|
| **From Mauch Chunk to New York* "towing limits," via Morris Canal | $2 65 |
| **From Mauch Chunk to Jersey City* "for reshipment," via Lehigh Valley R. R. | 2 45 |
| **From Phillipsburg to Hoboken* "for shipment," via Delaware, Lackawanna & Western R. R. | 1 34 |
| †*From Penn Haven to Elizabethport, Port Johnston and Hoboken*, via Central railroad of New Jersey | 2 41 |
| ‡*From Mauch Chunk to Elizabethport, Port Johnston, Hoboken and South Amboy*, via Lehigh Valley R. R. | 2 25 |
| *From Port Delaware to New York and Jersey City*, via Morris Canal | 1 74 |
| *From Mauch Chunk to Philadelphia* via N. P. R. R. | 1 75 |
| *From Schuylkill Haven to Philadelphia*, via canal. Freight 65c., tolls $1 10 | 1 75 |
| *From Tamaqua to Port Richmond* "for shipment," via P. & R. R. R. | 2 07 |
| *From Schuylkill Haven to New York*, via canal | 2 72 |
| *From Upper Lehigh to Jersey City*, via Central R. R. of N. J. | 3 24 |
| *From Tamaqua to Philadelphia*, via Phil. & Read. R. R. main line | 2 17 |

On canal coal at Jersey City an additional charge of 20 cents per ton will be made for transferring coal from boat to boat, and thirty cents per ton for placing the same on the wharves and re-shipping.

The rate on coal for way-points on the New Jersey railroads will be $1 15 per ton from Mauch Chunk to Phillipsburg.

* At a recent meeting of the N. Y. and Lehigh Coal Exchange, it was decided to make the price of coal at this point for *way trade* the same, whether shipped via canal or railroad.

* 46 cents additional to this rate is added on coal for consumption.

† The rate from Phillipsburg to these points is 83 cents per ton less. This rate does not include wharfage or shipping expenses at tide ports.

‡ From Penn Haven to these points it is 16 cents additional, and from Phillipsburg the rate is 91 cents less.

## Freights.

We have but little change to note with regard to the condition of river and sound freights as compared with our last. Inside vessels are in very full supply, while Cape Cod vessels are not so plenty as they have been. We hear of charters to Boston at the low rate of $1 20. A nominal rate to this point would be something like $1 30, and to Providence from 80c. to 90c. Philadelphia rates are firm at our last figures, viz.: Boston, $1 50 to $1 60, and to Providence $1 25 to $1 35. Baltimore and Georgetown rates have a tendency to advance. We quote from these points to Boston firm at $1 60; to Portsmouth, $1 70 is asked, and to New York the rate is from $1 35 to $1 40.

MESSRS. BIRD, PERKINS & JOB report foreign freights as follows:

*General Remarks.*—The condition of the freight market offers but little encouragement to shipowners; the markets which receive the bulk of our Exports afford such slight margin to shippers, even at the current low freights, that transactions are exceedingly limited, and those that are made partake largely of a speculative character, while the amount of tonnage arriving, seeking employment, shows no perceptible diminution. These are mostly foreign vessels, many arriving in ballast only, that have no alternative but to accept such rates homeward as are obtainable, whether remunerative or not.

*Coal.—From the Provinces to the States.*—We still hold orders for this business from Sydney, Glace Bay, Caledonia and Cow Bay, the rates for which remain unchanged from our last quotations. Vessels calling at either of the above ports will find our orders there. Although the rates are low, they are still preferable to ballast, vessels receiving their cargoes with despatch.

*From the Provinces to the West Indies and South America.*—The disposition among shipowners to accept lower rates for this business has enabled us to effect some transactions with some prospect of increased orders. The requirements of this trade are generally for cargoes of 400 to 600 tons. Had there been any indications of the present rates of freight sixty days since, some large orders for this business might have been secured. Not anticipating so great a decline from last year's freights, the bulk of the orders were placed in England, lim-

WORKING DRAWING OF AN

# ANTHRACITE COAL BREAKER,

TO ILLUSTRATE A PAPER ON

## "THE MECHANICAL PREPARATION OF ANTHRACITE,"

READ BEFORE THE AMERICAN INSTITUTE OF MINING ENGINEERS, MAY, 1874,

*BY RICHARD P. ROTHWELL, MINING ENGINEER.*

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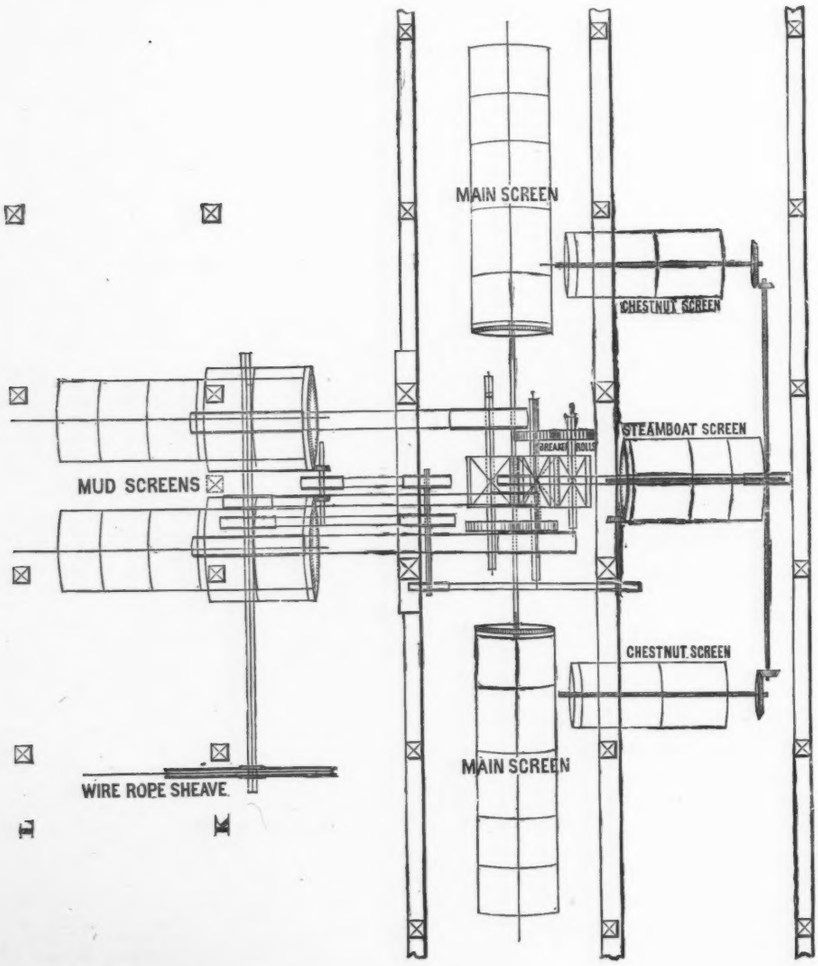
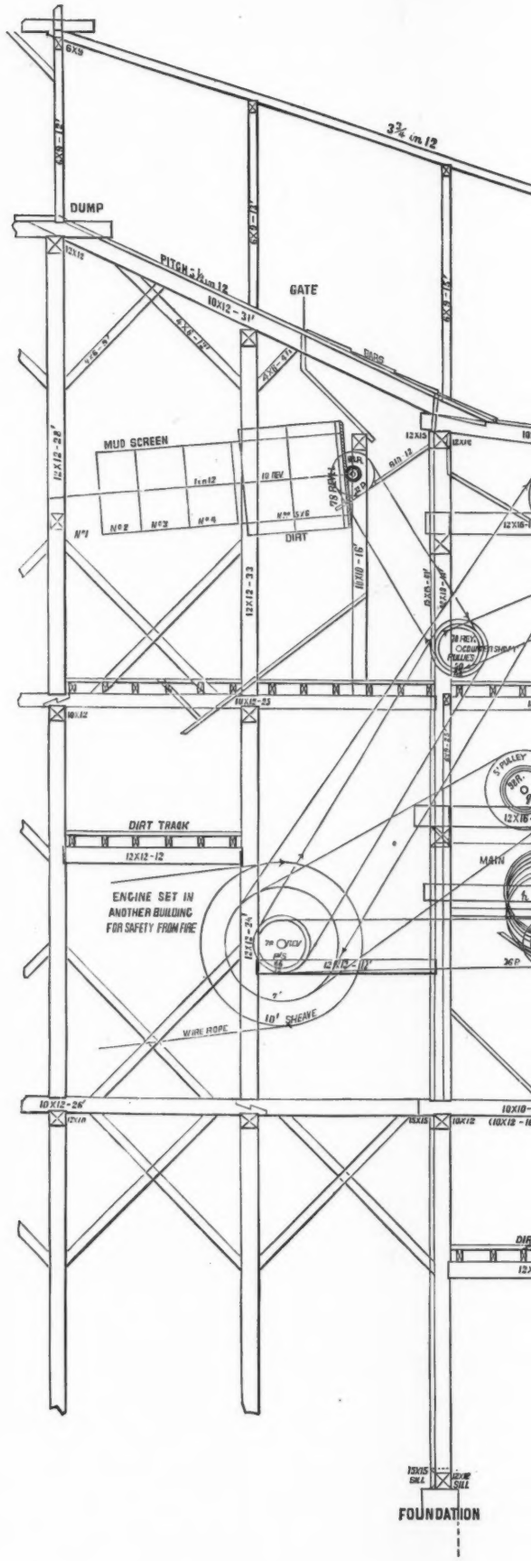
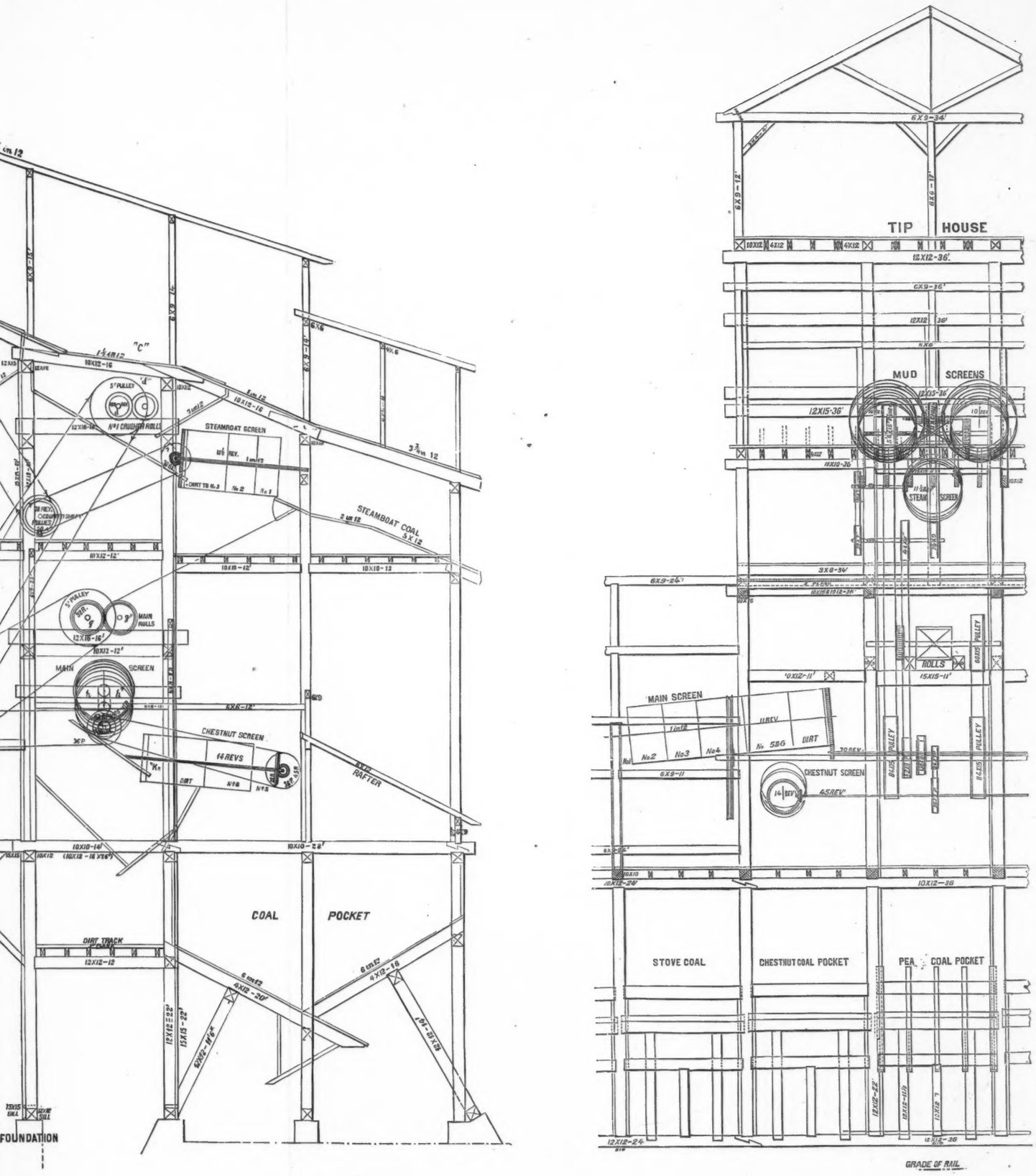
SCALE, ⅛ INCH TO THE FOOT.




TIP HOUSE
MUD SCREENS
STEAMBOAT SCREEN
STEAMBOAT COAL
MAIN SCREEN
MAIN ROLLS
CHESTNUT SCREEN
MAIN SCREEN
CHESTNUT SCREEN
ROLLS
COAL POCKET
STOVE COAL
CHESTNUT COAL POCKET
PEA COAL POCKET
FOUNDATION
GRADE OF RAIL

ited to what was considered low rates of freight, but which, in the general depression of other business, were readily accepted, thus diverting a trade which, it was hoped, had been secured for the Provincial Coal Companies. Our recent charters have been

535 tons cap., Pictou to Matanzas..... $3 00 gold.
660 " " " Brazil..... 5 50

We can use some medium-sized vessels at from $3 to $3 50, according to port of discharge in the West Indies. We note the charter of 1,200 tons cap., Pictou to Matanzas, at $3 50 gold.

*Pictou to the Mediterranean.*—We hold orders for this business; vessel required to proceed to direct port in the Mediterranean.

---

We note the consignment of another cargo of Red Bank house cannel to New England at $8 50 per ton. About 1,500 tons more are under contract for the same market at the same price. This coal is sent to Buffalo where it is shipped by the Erie Canal to this port at freights about $1 per ton less than all rail rates.

We note also the sale of a cargo of Cannelton cannel at $12 50 in New York, and a cargo of Cannelton splint at $7, both for gas purposes.

One of the encouraging signs of the times is in the efforts being made by the enterprising firm of BIRD, PERKINS & JOB to extend our markets by sending coal to several of the West Indian and South American ports that have usually been supplied from England. We even hear of their sending a cargo to the Mediterranean. We are indebted to this firm for the following information from some of the foreign markets:

*Bahia, Brazil, 29th Sept.*—"Our market has been supplied with about 2,400 tons, all to steamer agencies. Some small lots of Lancashire have been sold at 22 mil reis or, say, $11 gold per ton."

*Pernambuco, Oct 1.*—"The *Papillon* from Cardiff, with 774 tons of coal on dealers' account, is the only arrival within the month, and prices are nominal at 24 mil reis, Cardiff, and 20 mil reis, Lancashire.

*Montevideo, Sept. 12.*—"The arrival of coal has been moderate. We quote best *Cardiff steam*, $17, firm; House coal abundant, $13; *Smith's' coal* scarce, nominal value $19.

*St. Thomas. W. I., Oct. 12.*—"There is no demand whatever for coal at this port. All the steamship companies and private yards are liberally supplied. Four cargoes, shipped by the Cape Breton Company, to call at this port, have not been sold here, but to the Haytien Government at Port-au-Prince."

## REVIEW OF THE BRITISH COAL AND IRON TRADES.

Compiled from our exchanges bearing date to October 7th, 1874.

*London.*—The market has not been largely supplied with house coals during the week, and prices have remained steady. We note a general advance of 1/ per ton from our quotations of last week, original Hartlepool selling at 25/ 6d. The decrease of the coal trade of London for the first nine months of the present year, as compared with the corresponding period last year, amounts to 292,797 tons.

*North of England and Cleveland.*—The Iron trade of this district still exhibits an improvement. Rail manufacturers will be kept busy during the remainder of the year in filling some recent large orders. Foundry iron is also in good demand, and prices are firmer. No. 1 is quoted at from 70/ to 71/, and No. 3, 65/ to 66/.

The Coal trade of this district is irregular and unsettled, pending the result of the coal trade arbitration. Prices have fallen considerably, so that many mines must be working at a loss, and even under such circumstances some classes of coal are being put in stock.

*North Staffordshire.*—The general feeling in this district is one of improvement. Pig iron makers are blowing in furnaces week by week which have been idle all the summer. Prices have been slightly advanced. Mixed mine are quoted at from £3 15/ to £4 5/ and all mine £4 15/ to £5 10/. Coal is very plentiful and quotations are easier. Earl DUDLEY has reduced his price 3/ per ton, the price of best thick coal being 18/ 6d. and furnace 13/ per ton. Ironstones are firm and supplies scarce

*South Yorkshire and Derbyshire.*—There is not much alteration in the iron or coal trades in these districts, and quotations are unchanged. Barnsley house coal is quoted at from 11/ to 11/ per ton, and Silkstones 14/ 6d. to 15/ 6d. per ton at the pits.

*Lancashire.*—The pig iron trade of this district is unsettled, in anticipation of the results of the quarterly meetings. Prices during the week have advanced 1/ 6d per ton. No. 1 is quoted at 80/ 6d and No. 4 forge at 67/ 3d. The coal trade of this district is in a critical state, some 16,000 men being out on a strike. All qualities of coal are firm without any actual advance in quotations.

*South Wales and Monmouthshire.*—The South Wales trade is very dull, the large decrease of American orders and the anticipation of a strike at the Landore Steel Works, has completely prostrated the market. The coal out-put is good, prices are sustained, but no advance is probable.

*Glasgow.*—The Pig Iron market has been quiet during the week. Warrants m-n G. M. B. are quoted at 87/ 6d. per ton, f. o. b., prompt cash. No. 1 Gartsherrie, f. o. b. at Glasgow is quoted at 117/. Out of 156 furnaces only 41 were idle at the end of last week. The total decrease of shipments of pig iron from the 25th of Dec., 1873, to date, as compared with the corresponding period last year, amounts to 145,997 tons. Manufacturing coal is dull and unchanged. House coal is in good demand.

## IRON MARKET REVIEW.

### New York.

Oct. 23, 1874.

There is no improvement to note in the condition of the iron trade at this point, and none is expected for some months; in fact prices are declining, if anything, and quotations of No. 1 at $28@$30, and of No. 2 at $26@$28, are quite nominal, for purchasers with cash can in all cases get a pretty heavy discount from quotations.

We have no sales of American pig to report, except the usual sales on the Lehigh; these continue to absorb about the present make of the furnaces, and we do not hear of any of them going out of blast at present.

***Scotch Pig*** is scarce, with practically none in stock. We note sales of about 500 tons to arrive on private terms; there is now nearly 1000 tons on the way here but very few orders going out, though there has been a heavy reduction in price in Glasgow during the week. Our latest cable advices quote Gartsherrie 102/ 6d., Coltness 105/, Eglinton 86/, Glengarnock 96/. In this market we may quote Eglinton, nominally, $40. There is no other brand in the market.

***Rails.***—There has been more inquiry for rails during the week than for some time, but it has not resulted in much business; in fact, much of it was on Canadian account, and was probably made to *feel* this market, while the orders will doubtless be placed in England. We note the sale of between 4,000 and 5,000 tons American rails at private terms. The demand for rails must continue moderate till there is a revival in railroad construction and till the general business done by the roads makes it necessary to renew the track oftener. Now the Railroad Companies, like individuals, have grown exceedingly economical and buy sparingly. Our imports of rails, and these are confined to steel, have fallen, for the nine months of this year, to little over half the amount brought in the corresponding period of 1873.

Rail Exports of Great Britain to 30th September:

| | 1874. | 1873. |
|---|---|---|
| To the United State ..... | 85,454 tons. | 151,973 tons. |
| Total exports of rails..... | 637,995 " | 591,596 " |
| Total iron exports..... | 1,830,640 " | 2,296,990 " |

While the exports to this country have fallen off nearly 50 per cent, the total rail exports have increased about 8 per cent., but the grand total of iron exports have declined nearly *half a million tons.* This exhibit is very discouraging to the English iron trade. We quote American at $55; Steel $80, at the works.

***Old Rails.***—There have been no transactions, and quotations are nearly nominal at $30. Large quantities are offering. The Great Western, of Canada, offers 10,000 tons, along with a considerable quantity of other old iron and steel.

***Scraps.***—There is no business being done and quotations would be useless.

### Boston.

From the *Commercial Bulletin* of October 17.

Pig is a trifle better this week, but this is simply a spasmodic improvement owing to a great number of the little foundries happening in together, seeking each a five or ten ton lot. The selling rates are $29@30 for No. 1, and $27@28 for No. 2, the larger business at the outside rates. This business is all in American. The transactions of foreign are *nil*, prices having dropped to a point that importers cannot follow.

Bar is very uneven. One of our reporters in Worcester, Tuesday, noted that one Boston firm were seemingly making a point in that county of demoralizing the market. It's a safe thing for a consumer to be thoroughly satisfied that a $63 50 bar iron is sound. The market value on good bar iron is 3 cents a pound, or $67 20 a ton. Special shading on ton lots for cash of ¼ cent are made in instances, and this is below the cost to land from Pittsburgh, where 2 8-10 cents per pound or $62 72 a ton, is the lowest price; then adding 35 cents per hundred pound for freight, $7 84 a ton, and the first cost to replenish the market is $70 56

Steel is unchanged and quiet at 6½@10 cents for machinery and 17@17½ cents for good tool.

### Chicago

Oct. 20, 1874.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

Quotations are as follows:

| | |
|---|---|
| No. 1 Coltness | $46 00@ .... |
| No 1 Gartsherrie | 45 00@ .... |
| No. 1 Summerlee | 44 00@ .... |
| No. 1 Glengarnock | 42 00@ .... |
| No. 1 Eglinton | 40 00@ .... |
| Warner's "American Scotch" | 41 00@ .... |
| Massilon No 1 Foundry | 37 00@ .... |
| No. 1 Grand Tower Mo. ores (Bituminous) | 33 00@ .... |
| No. 2, " " " | 30 00@ .... |
| No. 1 Mill | 28 00@ .... |
| Union "A" 1 (Anthracite) | 32 00@ .... |
| Union "B" 1 (Anthracite) | 30 00@ .... |
| No. 1 Lake Superior (charcoal) | 34 00@ .... |
| No. 2 Lake Superior " | 32 00@ .... |
| No. 3 Lake Superior " | 36 00@ .... |
| No. 4 Lake Superior " | 42 00@ .... |
| Bessemer Steel Rails | 85 00@90 00 |
| New Iron Rails | 55 00@ ... |
| Old Rails | 28 00@30 00 |

### Cleveland.

Oct. 20, 1874.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore

Quotations remain as follows:

| | |
|---|---|
| No. 1, Anthracite Foundry | $.... @.... |
| No. | .... @.... |
| No. 1, Bituminous " | 31 00@.... |
| No. 2, " " | 29 00@.... |
| No. 1, " Gray Forge | 28 00@.... |
| No. 1, Massilon Black Band | 36 00@.... |
| No. B-1 " " | 34 00@.... |
| No. 2 " " | 32 00@.... |
| No. 1, Lake Superior Charcoal | 33 50@.... |
| No. 2, " " | 32 50@.... |
| No. 3, " " | 34 00@.... |
| No 4, " " | 35 50@.... |
| Nos. 5 and 6 " | 37 00@.... |
| American Scotch, No. 1, Cherry Valley | 34 00@.... |
| " " No. 2 | 31 00@.... |

### Cincinnati.

Oct. 20, 1874.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Trade has been a little more active during the past week, owing probably to further concessions obtained by consumers. The demand has been confined to foundry grades of C. C. pig iron. In other kinds there is but little doing. We quote:

CHARCOAL.

| | |
|---|---|
| Hanging Rock, No. 1, Foundry | $32 00@33 00—4 mos |
| " No. 2, " | 30 00@31 00—4 mos |
| " Mill | 27 00@28 00—4 mos |
| Tennessee No 1, Foundry | 30 00@31 00—4 mos |
| Tennessee. No. 2 " | 28 00@29 00—4 mos |
| " Mill | 27 00@28 00—4 mos |
| Missouri, No. 1, Foundry | 33 00@34 00—4 mos |

STONE COAL.

| | |
|---|---|
| Ohio No. 1, Foundry | 29 00@30 00—4 mos |
| " No. 2, " | 27 00@28 00—4 mos |
| Ohio Mill | 26 00@27 00—4 mos |
| Missouri, No. 1, Foundry | 30 00@31 00—4 mos |
| " No. 2, " | 29 00@30 00—4 mos |
| " Mill | 27 00@28 00—4 mos |

CAR-WHEEL.

| | |
|---|---|
| Hanging Rock, C. B. | 50 00@53 00—4 mos |
| Tennessee " | 45 00@48 00—4 mos |
| Missouri " | 45 00@48 00—4 mos |
| Alabama " | 45 00@48 00—4 mos |

BLOOMS.

| | |
|---|---|
| Charcoal | 80 00@ 90 00—cash |

SCRAP IRON.

| | |
|---|---|
| Cast | 75@ 1 00—cash |
| Wrought | 1 25@ 1 50—cash |

### Indianapolis, Ind.

Oct. 19, 1874.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

Continue quotations.

| | |
|---|---|
| New Rails at mill | $62 00@64 00 |
| Old Rails " | 30 00@31 00 |
| Hanging Rock Charcoal Pig No. 1 foundry | 35 00@36 00—4 mos |
| " " " " 2 " | 32 00@33 00—4 mos |
| " " " Mill | 29 00@31 00—4 mos |

STONE COAL.

| | |
|---|---|
| Indiana No. 1 Foundry pig Planet furn'e. | 32 00@34 00—4 mos |
| " 2 " " " | 31 00@32 00—4 mos |
| " 1 Forge " " | 29 00@ ....—4 mos |
| " 2 " " " | 27 00@ ....—4 mos |
| Ohio No. 1 Foundry pig | 33 00@34 00—4 mos |
| " 2 " | 31 00@32 00—4 mos |
| " 1 mill | 28 00@30 00—4 mos |
| Merchant Bar, card rates | 60 00@62 00—3 mos |
| 1st quality C. H. No. 1 Boiler Plates, per lb | .5¾@6 c.—3 mos |
| 1st " Com. Sheet, for No. 24, W.G. " | 5 c.—3 mos |
| 1st " Charcoal Sheet " " " | 6 c.—3 mos |
| Best Bloom Galvanized Sheet, discount | 20 per cent....—cash. |
| 2d quality " " " | 30 " ....—cash. |

f. o. b in Indianapolis.

### Louisville.

Oct. 20, 1874.

Specially reported by GEORGE H. HULL, Esq.

There has been no improvement in the demand during the last week. There is no change to note in prices, but concessions have to be made to effect sales of round lots.

The usual time, 4 months, is allowed on the quotations below.

HOT BLAST—CHARCOAL.

| | |
|---|---|
| No. 1 foundry, from Hanging Rock ores | $30 00@33 00 |
| No. 2 " " " | 28 00@29 00 |
| No. 1, forge, " " | 26 00@27 00 |
| No. 1, foundry, " Tennessee " | 28 00@30 00 |
| No. 2 " " | 27 00@28 00 |
| No. 1, forge, " " | 26 00@27 00 |
| No. 1, foundry, " Alabama " | 28 00@30 00 |
| No. 1 " " Iron Mountain " | 32 00@34 00 |

HOT BLAST—STONECOAL.

| | |
|---|---|
| No. 1, foundry, from Missouri ores | 30 00@33 00 |
| No. 2, " " " | 28 00@29 00 |
| No. 1, forge " " | 28 00@30 00 |

COLD BLAST—CHARCOAL.

| | |
|---|---|
| Car Wheel from Hanging Rock ores | 50 00@54 00 |
| " " Tennessee " | 45 00@46 00 |
| " " Alabama " | 48 00@50 00 |
| " " Georgia " | 48 00@50 60 |
| " " Missouri " | 45 00@46 00 |
| " " Kentucky " | 45 00@50 00 |

### Milwaukee, Wis.

Oct. 19, 1874.

Specially reported by Messrs. R. P. ELMORE & Co.

Our market still remains unchanged in price or animation, and we are still busy.

Per ton of 2,240 lb.

| | |
|---|---|
| Scotch ranges | $40 00 to$45 00 |
| No. 1, Lake Superior Charcoal | 36 00 to 38 00 |
| " 2, " " | 34 00 to 36 00 |
| " 1, " " Anthracite | 35 00 to 36 00 |
| " 2, " " " | 33 00 |

### Philadelphia.

Oct. 22, 1874.

From our Special Correspondent.

The only encouraging feature of the iron market here is a little inquiry for rails; prices are unchanged. No doubt this inquiry is stimulated principally by the extraordinary low

figures at which rails may now be purchased, and the possibility that many of the roads cannot longer avoid purchases. Pig iron is very low and devoid of animation. There is no prospect of any improvement in prices this winter. We quote No. 1 foundry, nominally, at $28@$30, and No. 2 $26@$28, rails, $57@$60.

### Pittsburgh, Pa.

October 20, 1874.

Specially reported by A. H. CHILDS, Esq., commission merchant for the sale of pig iron, blooms, ore, &c.:

The metal market continues very dull, and such demand as there is is confined to lots for immediate use. The iron most in request is the best quality of gray forge; the poorer grades being neglected, or sold only by conceding something more than the usual difference in price. Quotations are:

| | | | |
|---|---|---|---|
| No. 1 Foundry, anthracite or bituminous | $28 00@28 50 | —4 mos |
| No. 2, " " | 27 00@..... | —4 mos |
| Gray forge " " | 26 00@..... | —4 mos |
| Close " " " | 25 00@25 50 | —4 mos |
| White and mottled " " | 23 00@24 00 | —4 mos |
| Hot blast charcoal | 30 00@35 00 | —4 mos |
| Cold " " | 40 00@50 00 | —4 mos |

From the *American Manufacturer*.

PIG IRON.

WEDNESDAY, Oct. 21, 1874.

Trade continues dull and in a very unsatisfactory condition, and instead of improving, it is scarcely holding its own; the demand continues remarkably light for this season of the year, as the mills, without a single exception, are buying only for immediate requirements, and, as some of them bought pretty freely late in the summer, they are, and have been for some time past, out of the market altogether. However unpleasant it may be to producers and holders, there is no disguising the fact that the general tone and spirit of the market is weaker now than it was a month ago, and we learn upon good authority that there has been a slight decline within the past couple of weeks. The pig iron trade is nothing more than a problem, and it is one which operators generally have been endeavoring to solve for several months, but thus far without success. It was confidently expected during the summer by some of the more sanguine, that there would be an advance of from $2 to $3 per ton, during the fall, and so strongly were they impressed with this belief, that some of them bought on speculation, expecting to realize the advance in question. The fact is that trade generally has been deceived in the course of the market during the last couple of months; until quite recently the feeling prevailed not only among producers but consumers as well, that prices, if they did not rule higher, would at least hold their own during the remainder of the year. There are various causes for the reaction which has set in recently, to some of the most important of which we shall refer: it has been discovered that the production was larger than was generally supposed; also that stocks are large, and, if anything, increasing, as there is fully as much, if not more, being made than is being consumed, and, furthermore, the demand for the product has not turned out thus far as well as was expected it would. In a word, the great obstacle in the way of an advance in prices is the large supply of stock, and as long as the production is kept up, with no increase in the consumption, it is not reasonable to expect any material or healthy change for the better, and, as already intimated, the indications, at this writing, point to a lower instead of a higher range of prices. The best evidence that the market has reacted and is weaker, is that the producers, who were unwilling to sell in the summer when prices were from $1 to $2 per ton better than can now be realized, are now willing and anxious to sell.

MANUFACTURED IRON.

There is but little that is new or important to note in regard to the market for finished irons: while, as stated in our last review, trade has not thus far come up to general expectations, and our manufacturers generally have been disappointed. The mills, with one or two exceptions, are all in operation, and no doubt is entertained but that the majority of them will have about all they can do during the balance of the year; but had it not been for the fact that the most of them were well supplied with orders late in the summer, just about the time the fall trade was starting up, the situation to-day would not be as encouraging in this respect as it is. The demand this fall has not been as active as our manufacturers had expected; orders slacked off considerably after prices were advanced, which was not unexpected, but notwithstanding the advance was not sustained, business continues to drag. It is difficult to give quotations in the present condition of the market, as there are no regular established rates, each firm, we have reason to believe, acting independent of others in this respect, getting the best rates they can, and the indications are that prices will soon be back to where they were prior to the recent advance. The regular card rate for merchant bars is two cents and eight-tenths, but we have heard of orders having been booked recently at two cents and six-tenths, and we also hear it rumored that sales have been made at $2 75, delivered in Chicago, which, if we are not mistaken, is about equal to $2 50 here. Sheet iron continues in very fair demand, and prices are still pretty well sustained; Nos. 21 to 23 quotable at 4.6@4.7, usual time.

BITUMINOUS COAL SMELTED FROM L. S. ORE.

| | | | |
|---|---|---|---|
| 70 tons | No. 1 foundry | $28 00 | —4 mos |
| 90 " | No. 1 foundry | 27 50 | —4 mos |
| 200 " | No. 2 foundry | P. T. | |
| 60 " | gray forge | 26 50 | —4 mos |
| 30 " | gray forge, R. S. | 26 00 | —4 mos |
| 100 " | gray forge, medium | 26 50 | —4 mos |
| 200 " | gray forge, close | 25 50 | —4 mos |
| 100 " | gray forge | 26 50 | —60 day |
| 100 " | gray forge, close | 25 00 | —4 mos |
| 100 " | gray forge | 25 00 | —cash |
| 300 " | gray forge, C. S. | P. T. | |
| 300 " | gray forge | P. T. | |
| 300 " | mottled | 25 00 | —6 mos |
| 300 " | mottled | 25 00 | —4 mos |
| 150 " | mottled | 24 00 | —4 mos |
| 150 " | mottled | 23 00 | —cash |

CHARCOAL.

| | | | |
|---|---|---|---|
| 150 tons | No. 1 foundry, H. R. | $35 00 | —4 mos |

COKE.

| | | | |
|---|---|---|---|
| 90 tons | No. 1 foundry | $30 00 | —4 mos |
| 30 " | No. 1 foundry | 28 00 | —4 mos |
| 10 " | No. 2 foundry | 27 50 | —4 mos |
| 100 " | gray forge | 26 50 | —4 mos |
| 200 " | gray forge | 26 00 | —4 mos |
| 150 " | gray forge | 25 50 | —cash |
| 100 " | silvery | 26 00 | —4 mos |

NOTE.—In our reports very little of the iron made in the city is included, as in most instances, the parties owning the furnaces use the iron in their mills. This will add from 3,000 to 3,500 tons per week to our report.

### San Francisco.

From the *Commercial Herald* of Oct. 8th:

Recent imports of Scotch Pig Iron were mostly sold prior to arrival. Receipts include 66 tons Oregon pig iron ex *John L. Stevens*, and 28 tons same per schooner *Superior*. We continue to quote the price of this superior iron at $46. Tin plate continues quite a drug in the market at low and nominal rates. American cast steel is in liberal stock and has a depressing effect upon English brands. Assorted iron is in good stock, and prices unchanged. Lead of all descriptions is plentiful at steady prices.

## METALS.

NEW YORK, Oct. 24, 1874.

***Gold Coin.***—During the week past, gold has ranged from 109⅞ to 110¼, and closed yesterday at 110.

***Bullion.***—Fine silver bar is quoted at $1 25⅛@$1 26⅛, gold, per ounce, and fine gold bar at par ($20 67, gold, per ounce.) to ⅛th discount.

***Copper.***—The copper market still maintains its firmness, and from the strength of the parties controlling it, there is every prospect of the advance in prices being continued. Sales during the week, mostly to consumers, amounted to about 800,000 lb. at 22c.@22½c. cash for present delivery; 22¼c. is asked for November, 22¾c. for December, and 23c. for January and February delivery.

Our latest Cable information announces a decline to £82, or of £1, in Chile bars. This is probably owing in part, at least, to the advance in the Bank rate from 3 to 4 per cent.

From our last mail advices to Oct. 9, just received, we quote Messrs. VIVIAN, YOUNGER and BOND:

"At the Swansea Ticketing on Tuesday last, 1,319 tons British and Foreign Ores sold at an average of 15/ 5d. per unit, for an average produce of 14⅛ per cent., Cape Ores of 31¾ per cent. realizing 16/ 1¾d. per unit.

"By private treaty two cargoes of Chilian Ores sold at 16/ per unit, and two cargoes of Regulus at 16/ 6d. and 16/ 9d. per unit, all at Swansea.

"Chili Bars have been in demand at 10/ to 20/ advance on last week's prices, £82 10/ to £83 being paid for ordinary and picked brands, and also extended prompt, closing rather buyers at these prices, but waiting further Chilian news now due to the 2d inst. at Valparaiso, supposed to be delayed through the insurrection at Buenos Ayres obstructing the transit of messages.

"In Fine Foreign, Wallaroo sold at £91 to £92, and Burra, £89 10/ to £90 10/.

"Manufactured only in moderate request at £94 to £95 for strong Sheets. Tough, £88 to £89 paid for early delivery, and £90 to £91 for Best Selected."

***Tin.***—The market is languid, and prices here remain unchanged. We quote: Straits, 21¼@21⅜c.; L. & F., 21¼c.; English Refined, 21¾@21⅞c. Our latest cable news quotations in London were: Straits, £93, an advance of £1, Refined £98.

Singapore cable reports quote the price $24 50 per picul.

There is no change in the price of plates, which we quote as follows: I. C. charcoal, $9 75@$10; I. C. coke, $7 75@$8.

Our London mail advices to 10th inst. quote: At the Ticketing of Australian ores, on the 6th inst., of 70 tons, 56 tons were sold at £52 5/@£54 10/, and 14 tons at £22 10/@£29 for low quality. Sales of slab at 88/ 6d.@90/ as in quality, and 89/ to arrive, also 12 tons inferior at 84/. Straits in small request at 92/ down to 90/ 6d., and down to 89/ to arrive and for forward delivery.

***Tin Plates.***—In steady demand at 36/@37/ for I. C. charcoal, and 29/@30/ for I. C. coke.

***Lead.***—There has not been any activity in the lead market during the week. The Government has fixed the price at $6 35 gold. We may quote foreign at 6¼c. gold, and domestic 6¼c.@6½c. Our London advices quote lead "very firm, with sales at £22 5/ for good shipping brands, and £21 15/ to £22 for foreign."

***Spelter and Zinc.***—Very little has been done during the week in this market, and quotations remain unchanged at 6¾c. currency for domestic, and 6¾c. gold, for foreign. From London we learn that spelter "continues in demand, up to £23 15/ being paid for special brands of Silesian, and £24 for English."

### Miscellaneous Stocks.

NEW YORK, Oct. 23, 1874

Excepting a slight improvement in New Jersey Central and Delaware, Lackawanna & Western Railroad, the following list exhibits a decline as compared with our last. The transactions during the week show a decided falling off, prices, however, have been comparatively steady, indeed taking into consideration the irregular tendency of the general markets, the following class of stocks have probably been less affected by the *finesse* of stock operators than any others on the list.

| | Bid. | Asked. |
|---|---|---|
| New Jersey Central R. R. Co | 104 | 104⅜ |
| American Coal Co | — | 57 |
| Maryland Coal Co | 17⅛ | 18 |
| Pennsylvania Coal Co | 245 | 250 |
| Quicksilver Mining Co | 29 | 32 |
| Reading R. R. Co | 53¾ | 53⅞ |
| Delaware and Hudson Canal Co | — | — |
| Lehigh Coal and Navigation Co | 46¾ | — |
| Lehigh Valley R. R. Co | 60⅝ | 60¾ |
| Catawissa Preferred | 42¾ | 43 |
| Delaware, Lackawanna & West. R.R.Co. | 107½ | 107⅝ |
| Consolidated Coal Co | 45 | — |
| Little Schuylkill R. R. | 47¼ | 47¾ |
| Huntington & Broad Top R. R. prefrd. | 12 | 13⅛ |
| St. Louis & Iron Mountain | 15¾ | — |
| Morris Canal Preferred | 123 | 126 |
| Susquehanna Canal | 6 | 10 |

### Boston Stock Market.

BOSTON, Otober 22, 1874.

A decline of $4 per share in Calumet and Hecla and a slight advance of Quincy constitute the only changes which have occurred in the following list since our last. The transactions of yesterday were comprised in a few sales of Quincy and Allouez at our quotations.

| | | | |
|---|---|---|---|
| Allouez | 5¾ | Pewabic | — |
| Calumet and Hecla Co.* | 133 | Phœnix | — |
| Copper Falls | 10 | Quincy | 35¼ |
| Central | — | Ridge | 5 |
| Franklin | — | Rockland | — |

* Ex-dividend.

### San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, October 22, 1874.

The following report from the San Francisco Stock Board is dated the 19th inst. Crown Point has advanced $6 per share; the remaining portion of the list has slightly declined. The market has been very steady during the operations of the week, with the average volume of transactions.

The San Francisco *Commercial Herald* of October 5th compiles the following interesting figures showing the aggregate sales of mining shares at the San Francisco Stock Board for the first nine months of 1874 as compared with the three previous years.

| | |
|---|---|
| 1871 | $94,932,986 |
| 1872 | 160,934,623 |
| 1873 | 94,297,988 |
| 1874 | 152,050,840 |

The same contemporary observes developments of the Comstock lode are going on with alacrity, and the great index silver lode of the country shows to better advantage to-day than almost at any period since its discovery. Mining industries are becoming more and more extended, improved appliances bring greater results, and the operations generally are conducted in a more legitimate and satisfactory manner.

| | | | |
|---|---|---|---|
| Savage | 86 | Raymond & Ely | 17 |
| Crown Point | 62 | Meadow Valley | 6⅛ |
| Yellow Jacket | 109 | Eureka G. V. Bid | 8¼ |
| Kentuck | 21¾ | Ophir | 62 |
| Chollar Potosi | 72 | Alpha | 19 |
| Gould & Curry | 29 | Consolidated Virginia | 100 |
| Belcher | 66 | Overman | 76 |
| Imperial | 11 | Plioche | 6 |

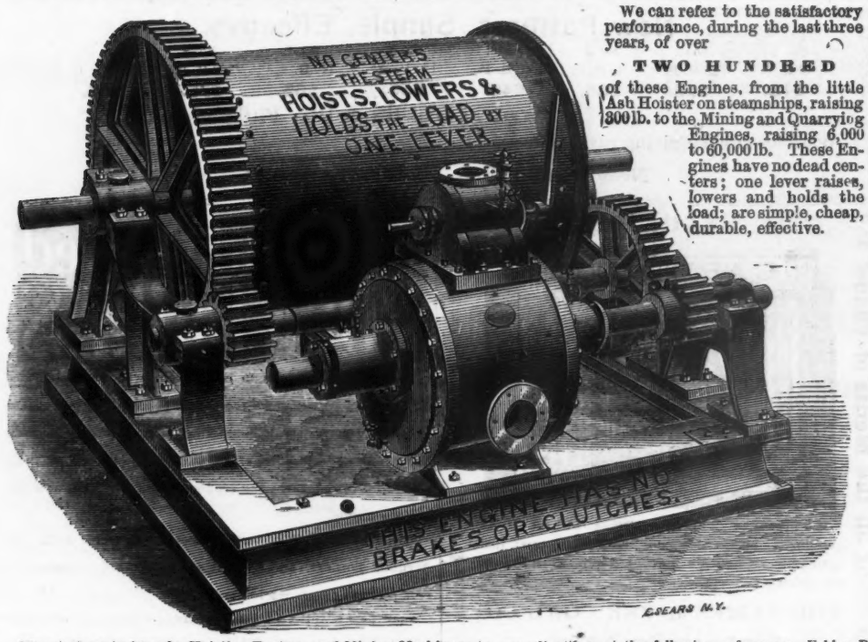
## American Institute of Mining Engineers.

OFFICIAL BULLETIN.

### Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of

## ROTARY REVERSIBLE HOISTING ENGINES.




We can refer to the satisfactory performance, during the last three years, of over

**TWO HUNDRED**

of these Engines, from the little Ash Hoister on steamships, raising 300 lb. to the Mining and Quarrying Engines, raising 6,000 to 60,000 lb. These Engines have no dead centers; one lever raises, lowers and holds the load; are simple, cheap, durable, effective.

We ask those looking for Hoisting Engines, and Mining Machinery to consult either of the following references: Eckley B. Coxe, Proprietor of Cross Creek Collieries, and Vice-Prest. of the Am. Inst. of Mining Engineers, Jeddo, Luzerne Co., Pa; J. H. Lyon, Pres't. Straitsville Coal Mines, Office 115 Broadway, New York; Geo. E. Hall, Pres't. Central Vermont Marble Co., Post Office Cleveland, Ohio; Ingersoll Rock Drill Co., No. 5 Park Place, New York; Gilbert Fowler, Chief Engineer Pacific Mail Steamship Co., Pier 42 North River, N. Y.; S. F. Shortland & Bro., Steam Lighters, 106 Wall st., New York; Divine Burtis, Jr., Contractor, Brooklyn, N. Y.; Wm. A. Lighthall Consulting Engineer, Office 5 Bowling Green, N. Y.; Erastus W. Smith, Consulting Engineer, Office 42 Dominick st., New York. Every Engine fully warranted. Made only by

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**165 Pearl Street, New York.**


his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The October meeting of the Institute will be held at Hazleton, Pa., beginning Tuesday evening, 27th inst. The following programme has been arranged:

OCT. 27.—Parties leaving New York by the Central R. R. of New Jersey at 7 A. M., or from Philadelphia by the North Pennsylvania R. R. at 8:30 A. M., arrive at Hazleton at 1 P. M. Members will assemble at the Central Hotel. Dinner. Visit to the coal mines and machine shops. Evening Session, for the communication of papers, &c., at Hazle Hall.

OCT. 28.—Leave Hazleton by train for Jeddo, Drifton, (carriages to Upper Lehigh.) Dinner at Drifton. Visit to Ebervale, Harleigh, Latimore, Milneville and Prospect Rock, returning to Hazleton in the evening. Meeting at Hazle Hall.

OCT. 29.—Visit to the neighborhood of Hazleton, or meeting; cars to Mauch Chunk. Trip by Switchback to Old Lehigh Company's mine, through the Nesquehoning Tunnel to Jigging House, thence to Mauch Chunk, where the Loiseau compressed fuel works will be examined Evening meeting.

OCT. 30.—Visit to Hockendauqua furnaces and iron mines; Bethlehem steel works. Adjournment.

THOMAS M. DROWN, Secretary, Lafayette College, Easton, Pa.


## BLASTING POWDER.

**LAFLIN & RAND**

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Mills in several different States of the Union.

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**ORANGE SPORTING POWDER,**

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**J. CLAYTON'S**
**Patent Crank and Fly Wheel**
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## PUMP,

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**Steam Pump.**

Price only $95.

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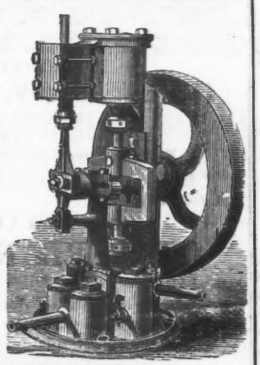

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NEW PATTERN. WITH IMPORTANT Improvements.

Used for reducing to fragments of any required size all hard and brittle substances, such as Stone for Macadam Roads, and for making Concrete, and for Ballasting Railroads; also for crushing IRON, COPPER, ZINC, SILVER, GOLD, and other Ores. Also for crushing Quartz, Flint, Emery, Corundum, Feldspar, Barytes, Manganese, Graphite, Phosphates, Plaster, Soapstone, Coal, Old Fire Brick, Mineral Paint, etc.

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*BLAKE CRUSHER CO., New Haven, Ct.*

Parties visiting New York can see a Crusher in operation at 137 Elm street.

## WM. B. BEMENT & SON
MANUFACTURERS OF
## MACHINISTS' TOOLS
OF ALL DESCRIPTIONS.
PHILADELPHIA, PA.


## MISCELLANEOUS.


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New York, 93 Liberty St., Pittsburgh Store, 285 Liberty Street.

## SCALES

The Celebrated Stock House Scale, New Style Testing Machines, All Sizes. Iron Lever Railroad Track Scales. Patented First Power Lever Wagon Scale, for Coal Dealers. Parallel Crane Beams and Mortising Machines. Hydraulic Jacks.


**FOR SALE**—AN UNFINISHED IRON, TWIN SCREW STEAM VESSEL, having double bottom and water-tight compartments.

| | |
|---|---|
| Length between Perpendiculars | 390 feet. |
| Breadth of Beam | 45 " |
| Depth to Main Deck | 24½ " |
| Displacement at 22 feet draught | 6,000 tons |
| Area of Midship Section | 800 sq. ft. |
| Number of Transverse Bulkheads | 7 |

ENGINES.

Two pairs, each pair driving one Screw.

| | |
|---|---|
| Diameter of Steam Cylinder | 72 inches. |
| Stroke of Piston | 45 " |
| Surface Condensers, area | 12,560 sq. ft |

SCREWS.

| | |
|---|---|
| Diameter | 18 feet. |
| Pitch | 27 " |
| Number of Blades | 3 |

BOILERS.

Ten in number; Ordinary Horizontal Fire Tubular Type.

| | |
|---|---|
| Total Heating Surface | 28,000 sq. ft. |
| Grate Surface | 876 " |

This vessel was intended to be completed for the State of New Jersey as an Ironclad. The plans were prepared and the work was carried on under the direction of Gen. George B. McClellan, U. S. A. All materials, and the workmanship are guaranteed to be of the best possible description.

The funds appropriated for the purpose of completing the vessel not proving sufficient, the Legislature of the State of New Jersey has directed that a sale be made to the highest bidder. A Commission, consisting of

*His Excellency Gov.* JOEL PARKER, of Trenton,
*Vice Chancellor* AMZI DODD, of Newark,
*Honorable Messrs.* W. W. SHIPPEN, and S. B. DOD, of Hoboken,

has been appointed to effect such sale.

Bids endorsed "PROPOSALS FOR PURCHASE OF IRON STEAMER, OR OF PARTS THEREOF," may be addressed to the GOVERNOR OF THE STATE OF NEW JERSEY, by whom they will be received at Trenton, N. J., until 12 o'clock M., on the second day of November next, at which time they will be publicly opened.

Blanks for proposals, and a pamphlet containing a detailed description of the vessel, as nearly completed, except as to armor and armament, may be obtained by addressing either member of the Commission or the undersigned.

Permission to examine the vessel, and to inspect the premises, may be obtained (by intending purchasers) on application at the Dry Dock, where the ship now lies, or to the consulting Engineer to the Commission, who will be prepared to exhibit drawings, to explain the structure of hull and machinery and to give any other information respecting the vessel.

R. H. THURSTON,
*Consulting Engineer to the Commission, Hoboken, New Jersey.*


## The Fletcherville Blast Furnace Co.

Manufacture Charcoal Pig Iron exclusively from New-Bed Pure Magnetic Ore, suitable for Bessemer, Malleable and Car-wheel purposes, or for Foundry use where very soft and strong iron is required.

| *Analysis of Average New Bed Pure Ore.* | |
|---|---|
| Metallic iron | 68. 24 |
| Oxygen with the iron | 26. 01 |
| Water | .38 |
| Insoluble Siliceous matter | 4. 32 |
| Sulphur practically | none. |
| Phosphorus | .038 |
| Alumina | .28 |
| Lime | .14 |
| Undetermined matter and loss | .592 |
| | 100.000 |

| *Analysis of No. 1 Bessemer Pig.* | |
|---|---|
| Undetermined matter and loss | .134 |
| Silicon | 1.019 |
| Carbon | 3.821 |
| Phosphorus | .048 |
| Sulphur practically | none. |
| Calcium | .140 |
| Metallic iron | 94.838 |
| | 100.000 |

**WITHERBEES & FLETCHER,**
**Port Henry, Essex County, N. Y.**
**Furnace at Fletcherville, near Mineville, N. Y**

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## COAL SHIPPERS.

COXE BROS. & CO., CROSS CREEK COLLIERY, MINers and Shippers of the Celebrated

Cross Creek Free Burning Lehigh Red Ash COAL.

FROM THE BUCK MOUNTAIN VEIN.

Unexcelled for Steam, Sugar House and Domestic use.

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THE WILKESBARRE COAL AND IRON COMPANY,

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Dec. 24-1y

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Agents for the sale of

Hillside Coal and Iron Company's

## COAL.

Docks for the receiving and shipping of Coal and other heavy freights,

OFFICES:

BUFFALO,

7 Main street,

Waverley, opposite Erie Railway Depot.

## RED BANK MINING COMPANY

ARE PREPARED TO SUPPLY THEIR

## GAS COAL AND CANNEL

from their Colliery near Bethlehem, Clarion County, Pa. These mines are situated directly on the line of the Bennett Branch of the Alleghany Valley R. R. (just completed) and only 20 miles from its junction with the Main Line at Red Bank. This position enables them to supply Gas Companies **in any part of New York State, and Northern Pennsylvania, by Rail direct from the Colliery at all seasons of the year**—or to points on the **Canals or Lakes, during navigation via Buffalo or Erie.**

The **Gas Coal** (Red Bank Orrel) is specially adapted to **Gas Manufacture**, its yield being as large as that of any Caking Coal in the market, of easy purification and good illuminating power.

**The Cannel** is superior to any of the Ohio Cannels, obtainable and can be delivered in any required quantity, from one car and upwards. For particulars as to price, etc., apply to

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January 23:1y

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## KOH-I-NOOR COAL.

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5 Doane St., }
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New Patterns, Simple, Effective.

| No. 2. | No. 3. | No. 4. | No. 5. | No. 6. | No. 7. | No. 8. | No. 10. |
|---|---|---|---|---|---|---|---|
| 10 H P. | 25 H. P. | 45 H. P. | 70 H. P. | 100 H. P. | 140 H. P. | 190 H. P. | 275 H. P. |
| $18. | $25. | $35. | $45. | $55. | $65. | $75. | $95. |

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It burns freely, like Cannel Coal, without smoke, sulphur, or bituminous odor, enduring longer than anthracite. Ninety-six per cent. combustible, two and one-quarter per cent. ashes.

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WHOLESALE

## COAL AND IRON MERCHANT.

ANTHRACITE AND BITUMINOUS COALS,

Embracing Old Company Lehigh (Summit Hill), Room Run, (Free Burning White Ash), Plymouth Wyoming Red Ash Coal, also the celebrated Baltimore vein Wilkesbarre Coal, Hampshire and Barton George's Creek Coal.

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July 4-1y

WM. BORDEN. L. N. LOVELL.

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FOR RAILROAD, STEAMSHIP AND GENERAL USES.

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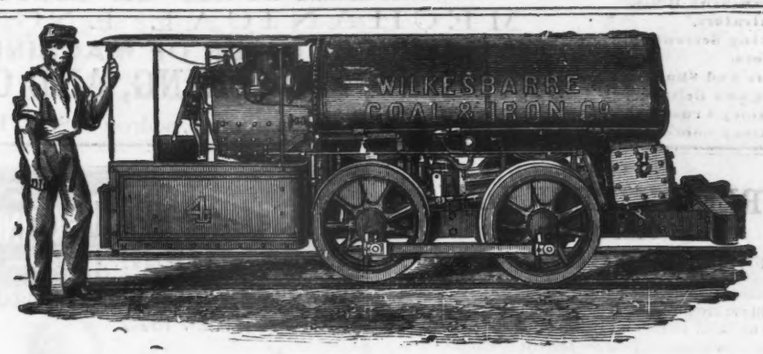


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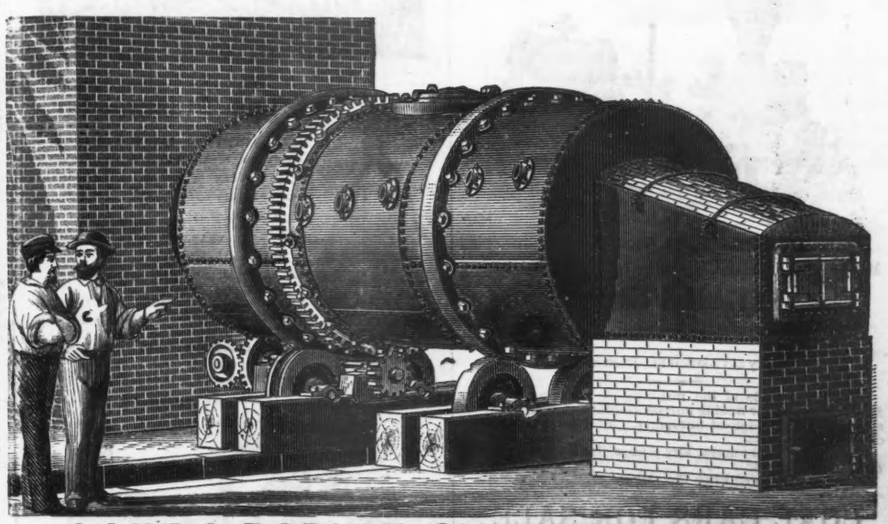

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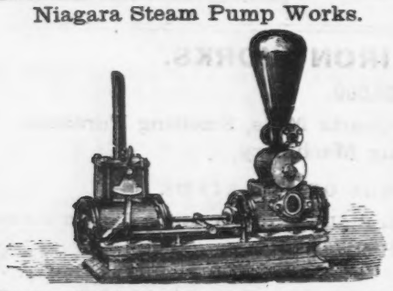

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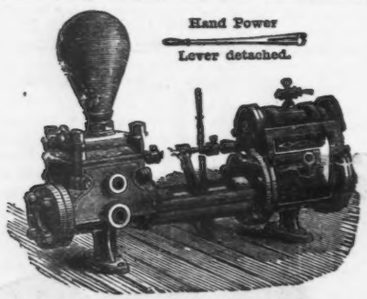


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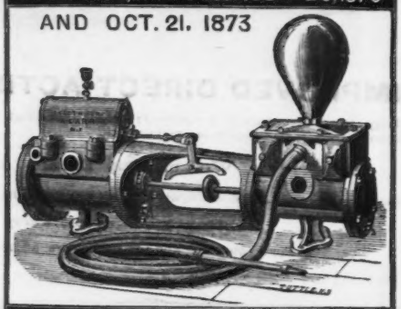

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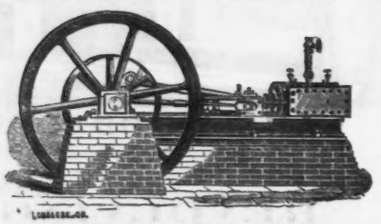

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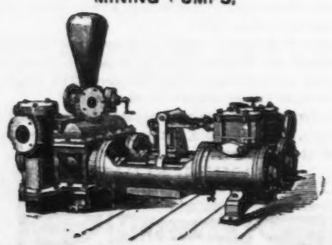

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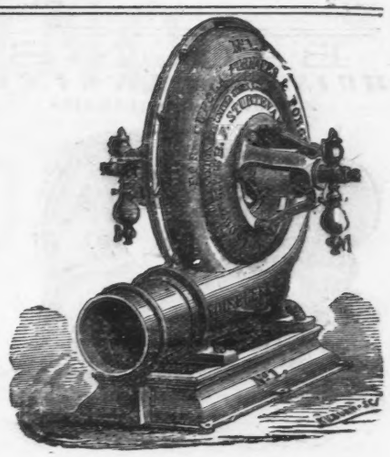

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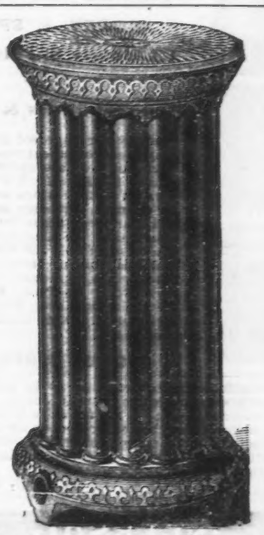

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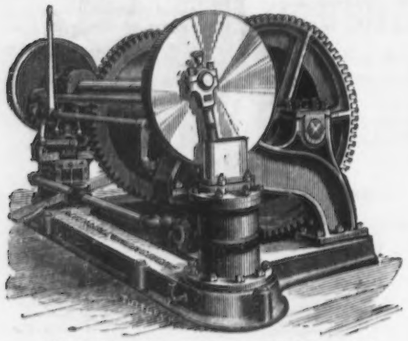

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☞ Look at following extract, Ingersoll Co.'s letter of excuses, ENGINEERING AND MINING JOURNAL, June 6, and compare with their advertisement: "I had *two* drills at the mine from the commencement, one beginning work on the 4th of April, the other on the 7th of the same month, and both drills working until the 1st of May." Signed, C. N. ELLIOTT, Superintendent Ingersoll Rock Drill Co.
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| Second " | " | 459 | 257 | 136 |
| | | 918½ | 545 | 136 |

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Second week " " " " .....459 "
918½ ft.

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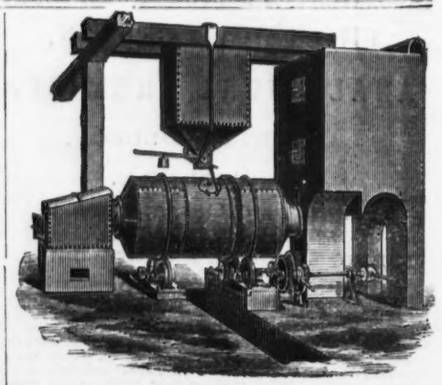

**TEAT'S PATENT FURNACE FOR ROASTING, Desulphurizing, Chloridizing and Oxidizing Ores, etc.**—For the reduction of Gold, Silver, Lead, and other ores, saving a larger percentage, at less cost, than any other invention now in use. Chloridizing Silver ore more thoroughly, in less time, with less fuel, salt and labor; also, roasting Lead ore preparatory to smelting, better and cheaper than any other invention. The Furnace is so constructed that one man, of ordinary ability, tends five or more furnaces; controls them with ease; adding heat and air; stopping or starting at will; charging and discharging with ease. Also, Patent "Conveying Cooler," for conveying and cooling roasted ores, heating the water for amalgamation and the boilers at the same time. Saving the large space in mill (covered with brick or iron), and the labor of two men per day, exposed to the poisonous chlorine gases. Also, Patent Air Blast "Dry Kiln," for drying ores direct from the mine or breaker, saving fuel and labor heretofore necessary in drying ores for dry pulverizing For description refer to ENGINEERING AND MINING JOURNAL, No. 9, August 29, 1874. For particulars address TEATS & BREED No. 12 West 8th street, Cincinnati, Ohio.
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